

CHINA.

IMPERIAL MARITIME CUSTOMS.

II.—SPECIAL SERIES: No. 2.

MEDICAL REPORTS,

FOR THE HALF-YEAR ENDED 31ST MARCH 1883.

25th Issue.

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PUBLISHED BY ORDER OF

The Inspector General of Customs.

SHANGHAI:
STATISTICAL DEPARTMENT
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National Oceanic and Atmospheric Administration

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INSPECTOR GENERAL'S CIRCULAR No. 19 OF 1870.

INSPECTORATE GENERAL OF CUSTOMS,

PEKING, 31st *December* 1870.

SIR,

1.—It has been suggested to me that it would be well to take advantage of the circumstances in which the Customs Establishment is placed, to procure information with regard to disease amongst foreigners and natives in China; and I have, in consequence, come to the resolution of publishing half-yearly in collected form all that may be obtainable. If carried out to the extent hoped for, the scheme may prove highly useful to the medical profession both in China and at home, and to the public generally. I therefore look with confidence to the co-operation of the Customs Medical Officer at your port, and rely on his assisting me in this matter by framing a half-yearly report containing the result of his observations at.....upon the local peculiarities of disease, and upon diseases rarely or never encountered out of China. The facts brought forward and the opinions expressed will be arranged and published either with or without the name of the physician responsible for them, just as he may desire.

2.—The suggestions of the Customs Medical Officers at the various ports as to the points which it would be well to have especially elucidated, will be of great value in the framing of a form which will save trouble to those members of the medical profession, whether connected with the Customs or not, who will join in carrying out the plan proposed. Meanwhile I would particularly invite attention to—

a.—The general health of.....during the period reported on; the death rate amongst foreigners; and, as far as possible, a classification of the causes of death.

b.—Diseases prevalent at.....

c.—General type of disease; peculiarities and complications encountered; special treatment demanded.

d.—Relation of disease to { Season.
Alteration in local conditions—such as drainage, &c.
Alteration in climatic conditions.

e.—Peculiar diseases; especially leprosy.

f.—Epidemics { Absence or presence.
Causes.
Course and treatment.
Fatality.

Other points, of a general or special kind, will naturally suggest themselves to medical men; what I have above called attention to will serve to fix the general scope of the undertaking. I have committed to Dr. ALEX. JAMIESON, of Shanghai, the charge of arranging the Reports for publication, so that they may be made available in a convenient form.

3.—Considering the number of places at which the Customs Inspectorate has established offices, the thousands of miles north and south and east and west over which these offices are scattered, the varieties of climate, and the peculiar conditions to which, under such different circumstances, life and health are subjected, I believe the Inspectorate, aided by its Medical Officers, *can do good service in the general interest in the direction indicated; and, as already stated, I rely with confidence on the support and assistance of the Medical Officer at each port in the furtherance and perfecting of this scheme.* You will hand a copy of this Circular to Dr., and request him, in my name, to hand to you in future, for transmission to myself, half-yearly Reports of the kind required, for the half-years ending 31st March and 30th September—that is, for the Winter and Summer seasons.

4.—

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I am, &c.,

(signed)

ROBERT HART,

I. G.

THE COMMISSIONERS OF CUSTOMS,—*Newchwang, Ningpo,*
Tientsin, Foochow,
Chefoo, Tamsui,
Hankow, Takow,
Kiukiang, Amoy,
Chinkiang, Swatow, and
Shanghai, Canton.

SHANGHAI, *1st August 1883.*

SIR,

IN accordance with the directions of your Despatch No. 6 A (Returns Series) of the 24th June 1871, I now forward to the Statistical Department of the Inspectorate General of Customs, the following documents:—

Report on the Health of Ichang, pp. 1, 2 ;

Report on the Health of Amoy, pp. 3-6 ;

Report on the Health of Canton, pp. 8, 9 ;

Report on the Health of Pakhoi, p. 18 ;

Report on the Health of Shanghai, pp. 19-36 ; each of these referring to the half-year ended 31st March 1883.

Report on the Health of Swatow, p. 7 ;

Report on the Health of Hoihow, pp. 10-17 ; each of these referring to the year ended 31st March 1883.

Notes on the prevalence of Epidemics in 1882, and on certain Native Drugs, pp. 37-40.

I have the honour to be,

SIR,

Your obedient Servant,

R. ALEX. JAMIESON.

THE INSPECTOR GENERAL OF CUSTOMS.

PEKING.

The Contributors to this Volume are :—

A. HENRY, M.A., L.R.C.P.Ed., L.R.C.S.Ed.	Ichang.
B. S. RINGER, M.R.C.S., L.S.A.	Amoy.
J. POLLOCK, L.K.&Q.C.P., L.R.C.S.I.	Swatow.
J. F. WALES, B.A., M.D., CH.M.	Canton.
E. A. ALDRIDGE, L.K.&Q.C.P.I.	Hoihow.
J. H. LOWRY, L.R.C.P.Ed., L.R.C.S.Ed.	Pakhoi.
R. A. JAMIESON, M.A., M.D., M.R.C.S.	Shanghai.
D. J. MACGOWAN, M.D.	Wénchow.

Dr. A. HENRY's Report on the Health of Ichang for the Half-year
ended 31st March 1883.

DURING the winter months the health of the members of the Customs staff was uniformly good. The weather was generally fine and conducive to health-giving out-door exercise. Until about the middle of March the health of the native community was reported to be good. With the beginning of spring, however, an exceedingly unhealthy period set in, which continued to the end of the period under review. Severe malarial fever and cholera have caused a high mortality among the native population of both city and suburbs. Further details I hope to give in my next Report. It is sufficient now to state that we have done what we could in the way of sanitary precautions. Little, however, can be done to improve the condition of the Chinese houses, in which most of the foreigners here reside. Considering how unhealthily the warm season has begun, it is not without misgivings that one contemplates the outlook for the summer of the occupants of these badly-drained habitations, which are both damp in wet weather and intensely hot in the trying months of July and August.

Natives have shown no willingness to entrust themselves to foreign medical treatment, save in trivial cases. When severe illness attacks them, they dread the supposed powerful effects of foreign drugs. Some cases of ague, stomachic ailments, diarrhoea, ulcers, etc., have been, however, treated with fair success.

A severe case of amaurosis clinica occurred in a foreigner who was living in Chungking during the winter. He took several doses of quinine in quick succession, to cure an ague, and as a result suffered from dilatation of the pupils, blindness and delirium, lasting a few days. It is advisable that travellers and residents in out-of-the-way places should be aware of the serious results that may arise from an over-dose of quinine. It appears that some people are very susceptible to its action. There is a case on record where the taking of 15 grains in five hours caused total blindness for three days, and limited vision for over a year. Convulsions and delirium may occur. The colour-blindness which accompanies the failure in regard to perception of light is said to take a long time in clearing up.

A severe epidemic of diphtheria declared itself during the winter in Chungking, and cut off great numbers of people. I cannot find out that the disease occurs here. Measles and small-pox in this place are common diseases of childhood, and they are both attended with considerable mortality. This spring a good deal of vaccination has been done at the instance of an association which subscribed the funds necessary for obtaining the lymph from Hankow. Whether owing to this or not, small-pox has not been nearly so prevalent this year as in former years. A great deal of good might be done by missionaries learning to vaccinate. Even being able to distinguish between spurious and true vaccination would be of some service, considering that the vaccine matter of native practitioners is sometimes fictitious.

As cremation is a subject of some interest at the present time, it may not be out of place to give a few details concerning the practice as carried on in this neighbourhood. Sometimes children are cremated. This is only done for superstitious reasons. Where several young children of a family have died in succession, the body of one of them is burned, the supposition being that the ceremony will ensure the survival of the next child that is born to the family. I witnessed last summer one performance of the kind. The body was simply brought to the open fields in a box, some firewood was piled round it and set fire to. The absence of odour was remarkable.

The books in which the subject of cremation in China is treated of only speak of the rite being followed in the cases of Buddhist priests and lepers. It is hard to reconcile with the present almost universal practice of burial, or with the absence of mention of cremation in Chinese historical works, the repeated assertions of Marco Polo that the Chinese people, in every place he came to, were in the habit of burning their dead.*

In this neighbourhood, out of the many Buddhist temples around, there is only one the inmates of which are burned after death. The manner in which the process is carried out is both efficient and æsthetic, and, moreover, it is not expensive—at least, the cost does not bear comparison with the large sums that the admirers of the practice in Europe are reported to incur. In the grounds of the temple there is a small dome-like edifice the interior of which communicates with the open air by only a small door. On a stone seat inside the dome the dead priest is placed in a sitting posture, and around him is piled a quantity of charcoal and firewood. This is set on fire; the door is then shut until combustion is complete. The calcined bones are collected and placed in a jar, which is preserved in one of the niches in an adjoining mortuary chapel. The latter building is also a small dome, and contains great numbers of these mortuary urns.

I append a table, which gives an abstract of the meteorological readings for the half-year, taken by Mr. Assistant Examiner LE BRETON.

METEOROLOGICAL TABLE.

MONTH.	THERMOMETER (FAHR.).				BAROMETER.		RAIN.	
	Highest.	Lowest.	Average Highest.	Average Lowest.	Highest.	Lowest.	Rainfall in Inches.	Number of Days.
1882.	°	°	°	°	<i>Inches.</i>	<i>Inches.</i>		
October.....	75	48	67	61	30.34	29.86	11.54	23
November.....	62	40	56	48	30.55	30.03	2.11	11
December.....	65	30	47	39	30.72	29.88	0.97	10
1883.								
January.....	53	30	44	35	30.61	29.75	0.33	6
February.....	52	31	45	38	30.46	29.96	1.09	11
March.....	71	41	61	50	30.30	29.64	0.53	9

* YULE'S *Marco Polo*, ii, 550. DOOLEY'S *Social Life of the Chinese* (New York: Harper & Brothers, 1876), i, 244; ii, 257.

Dr. B. S. RINGER's Report on the Health of Amoy for the Half-year
ended 31st March 1883.

DURING the past six months the pleasantly cool season of this port rapidly dissipated the various lesser maladies which usually trouble foreign residents in hot climates.

Four births (one still-born child) and four deaths have to be recorded. One of the latter was caused by fatty degeneration of the heart.

On the external surface of the pericardium a large quantity of fat was found, in some parts collected into pendulous and lobulated masses; the anterior mediastinum also contained similar formations. The muscular walls of the heart were throughout thin and pale. The left ventricle was covered with a thick layer of fat, while the walls of the right ventricle were almost entirely replaced by that tissue. The right auricle was thinned, almost to transparency, and the left auricle contained some atheromatous deposits.

The remarkable circumstances connected with this case are that the patient was still young and in vigorous muscular condition in other parts of the body, and had only complained of slight heart symptoms a few months previous to his death, which was quite sudden and unexpected.

Aneurism of the ascending and transverse portions of the aorta was the cause of death in the case of a German naval officer, who died after a short residence on shore. The death was somewhat lingering, and constant restlessness attended the last few days of life. The disease was diagnosed previous to its fatal termination.

A German resident, aged 43, male, was admitted into the Kulangsu Hospital suffering from chronic bronchitis, chronic nephritis, ascites and anasarca. He had been a very hard drinker, and his health began to fail four years and a half ago. He died 23 days after admission, 710 ounces of liquid having been drawn off by Southey's trocar and drainage tube.

Suicide was the cause of death in the fourth case, and the circumstances connected with it are so peculiar that I record them fully below:—

H., a man, 32 years of age, in charge of a light station, had surreptitiously obtained a quantity of intoxicating liquids, of which he drank to excess for several days, the result of which was that he was attacked by delirium tremens, which took the form of suicidal mania. Having obtained a bottle of tincture of hyoscyamus from the medicine chest, he drank the contents, and then confessed his act and desire to destroy his life to his companion in charge at the light station, who now determined to watch him carefully. In the middle of the night he got up and went into a passage, talking wildly to an imaginary friend, but was eventually put back to bed. The next day he vainly attempted to gain access to the tower, for the assumed purpose of quietly writing letters. It is nearly 40 feet high, and is surrounded at the bottom by stone pavement.

About 11.30 that night he entered his friend's room, and taking up a pair of compasses from the inkstand, endeavoured to thrust them into his right temple, using a hair-brush as a mallet, but was quickly prevented from inflicting more than two slight wounds through the skin. Finding himself again foiled, he conversed reasonably and seemed quiet.

The next morning, in the presence of his companion, he took up a feather-broom with a rattan handle, and appeared to be dusting the wall with it. Suddenly, his friend, hearing a choking sound, looked up, and saw the patient standing with his head strained backwards, and the feathers of the broom protruding from his mouth, the long handle having quite disappeared down his throat. He rushed to the spot and tried to withdraw the broom, but was unable to do so, as the patient struggled violently all the time to thrust it further down. Having called two Chinamen to his assistance, they between them succeeded, after great difficulty, in extracting the broom, when, to their dismay, they perceived that a considerable portion of the rattan handle was wanting. There was no sign of it in the mouth, and on questioning the patient, who now again became perfectly calm and reasonable, he gave it as his opinion that the fragment of rattan was somewhere deeply seated in the throat, and complained of considerable pain on the left side of the neck.

He was now placed in bed, where he remained quietly for several days, suffering from cough, pain and swelling of the throat, and was only able to swallow liquids.

On the 9th January 1883, in response to a signal brought in by a passing steamer, I visited the light station in the revenue cruiser at the time on lighthouse service, and found the patient, six days after having committed this last act of violence upon himself, in the following condition. He was quiet and reasonable, replying to questions clearly. He did not attempt to deny that he had purposely endeavoured to destroy his life, and considered that various hallucinations which he suffered from at the time, and which made him of opinion that he was unfit to live, were produced by his excessive indulgence in drink, which he was unaccustomed to at other times. He complained of great pain in swallowing, particularly on the left side of the throat. He was also troubled with constant loose cough, and expectorated frequently. On the 10th January he was taken into the Sailors' Hospital at Kulangsu.

Upon examining his throat nothing unusual could be detected, and on passing the index finger as far as it would reach into the pharynx, nothing abnormal could be felt. There was a slight swelling at the root of the neck externally, which was rather tender to the touch, and the patient believed there was a hole corresponding to this spot internally, through which the broom handle had been thrust, but no evidence of its existence could be found. There was considerable dulness on percussion all over the base of the right lung, and in this region the respiratory murmur was almost inaudible. At the upper surface loud mucous râles were heard, and the breathing was laboured. On the left side there was a little dulness at the base posteriorly; otherwise normal. Copious expectoration of dark brown, frothy liquid of most offensive odour existed; so powerful, indeed, was this smell that it pervaded the whole ward. The patient was of opinion that all this discharge came from what he called the "little hole," above referred to, and said that if he turned upon the left side when in the recumbent position, a quantity soon collected in his throat, and he was obliged to rise and spit it out. Examined under the microscope, numerous pus and blood cells were observed, also a few vegetable fibres, which bore an exact resemblance to those scraped from a rattan. No disorganised lung tissue could be detected in any of the specimens examined. This condition continued for three days, when the patient died from exhaustion, the temperature being on that day 101°.2, and the pulse 128,—these being the highest figures recorded. At the postmortem examination the following points were noted:—

On a level with the first ring of the trachea, extending backwards and downwards to beneath the anterior border of the sternomastoid, and underlying the omohyoid muscles, was observed a soft, puffy swelling, which on dissecting off the muscles was found to be about the size and shape of a green fig, with the apex pointing upwards and outwards. On puncturing it a quantity of foul smelling air escaped, followed by grumous material similar in appearance to that which ran continuously from the nostrils as the head hung over the end of the postmortem table, and on laying it open a quantity of this material was discharged.

The finger being now introduced and passed upwards round the great cornu of the hyoid bone on the left side, entered freely into the pharynx and impinged on a finger passed by the mouth. The cavity



FIG. I.
(Ad nat. del.)

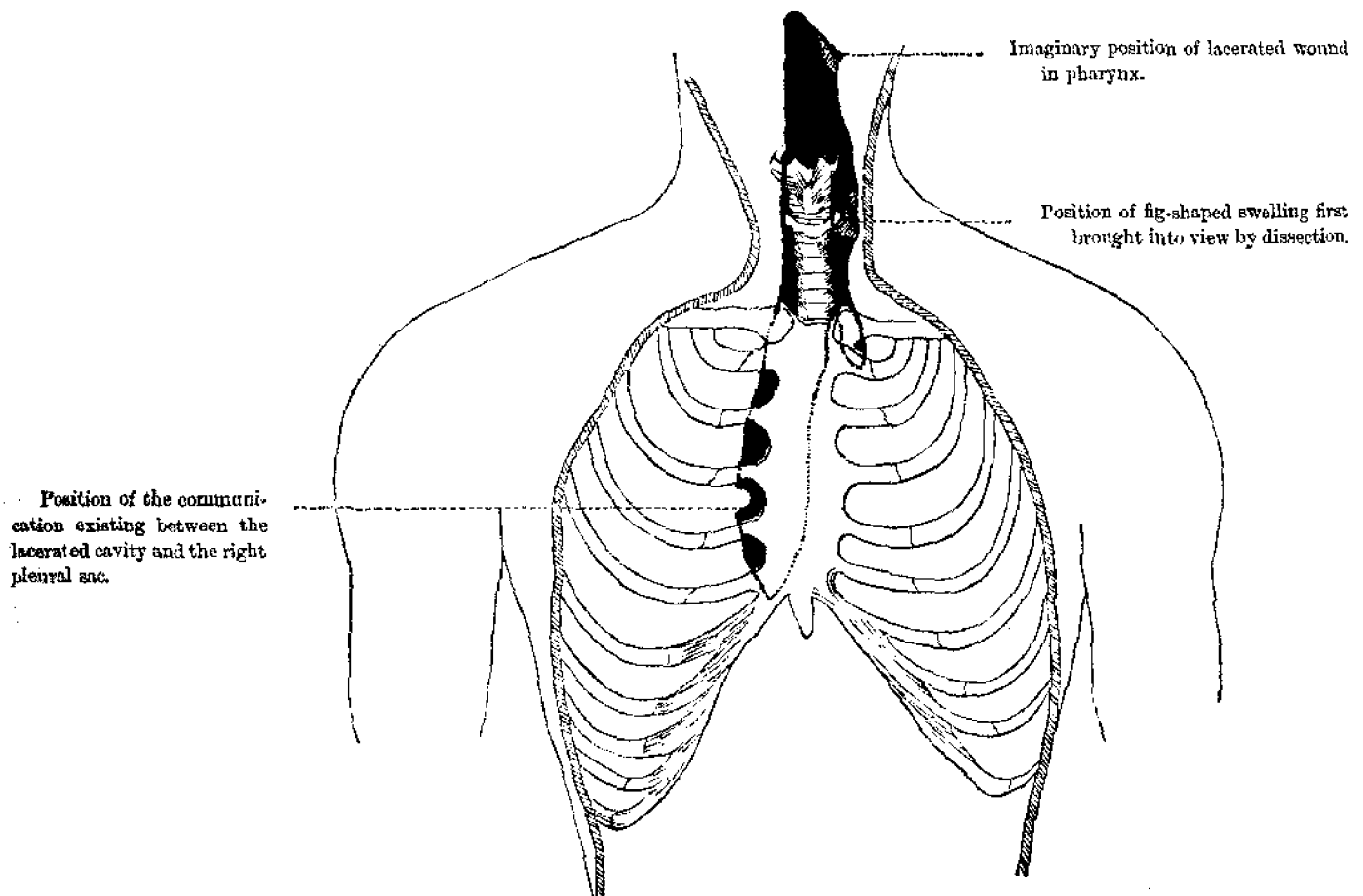


FIG. II.

(The red dotted lines and shading roughly indicate the course taken by the rattan, and referred to in the text as the "cavity.")

also extended upwards behind the posterior wall of the pharynx, and downwards behind the sternoclavicular joint farther than the finger could reach. No foreign body was found in this cavity.

On removing the sternum the right pleura was seen to be completely disorganised anteriorly and laterally, and thickly coated internally with putrefactive matter, and about half full of grumous material of a dark Spanish brown colour and indescribably offensive odour. In the midst of this, between the compressed lung and the ribs, was found floating a piece of rattan $5\frac{2}{10}$ inches long, cut sharply off at one end and broken off obliquely at the other, which pointed downwards. A representation of the fragment is given in Fig. I.

On dissecting up the larynx, the cavity on the left side was found to extend across the middle line and pass downwards beneath the inner end of the first rib into the posterior mediastinum on the right side of the spine. The posterior mediastinum communicated with the right pleural sac by an opening opposite the lower part of the root of the lung, which was surrounded by broken down tissue. The cavity on the left side also extended downwards on the left side of the spinal column towards the apex of the left pleural sac, but did not open into it.

The anterior wall of the cavity having now been cut through, a large space was found in the position of the posterior mediastinum, the walls of which were lined with sloughy material. This space extended downwards to the root of the right lung, at which spot sloughing was taking place, but had not yet made an opening into the bronchi; behind the root of the lung, however, sloughing had extended into the lung tissue. The whole organ was highly congested and in parts hepatised, exuding on section a dark coloured liquid very slightly frothy.

The dotted red lines and shading in Fig. II represent the lacerated cavity formed by the forcible introduction of the broom handle.

The postmortem appearances are extremely interesting, as explaining some of the points observed during life; *e.g.*, the accumulation of the expectorated material in the throat when lying on the left side; the pain on the left side of the neck in the region of the fig-shaped swelling, where the laceration was very severe, and near the surface; also the presence of the vegetable fibres found under the microscope. The position of the fragment of rattan in the chest was no indication of the direction in which it entered, as the quantity of liquid was sufficient to allow it to float in various directions with the movements of the body.

The great force necessary to have produced not only so severe and deeply seated an injury, but also to have broken so tough a structure as rattan, are matters not a little remarkable; and the subsequent termination of this self-inflicted violence renders the case, as far as I have been able to discover, unique in the annals of medical jurisprudence.

The following notes of two cases of bullet wound treated in the Kulangsu Hospital have been handed me by Dr. McDougall:—

MADA SINNUSKIE, Japanese boarding-house keeper, admitted 28th January 1883, was suffering from bullet wound of chest, with compound comminuted fracture of the clavicle. Shortly before admission the patient had been shot by another Japanese with a large revolver, which was fired at a distance of about 4 feet from his body. The ball entered about an inch below the middle of the left clavicle, and, slanting upwards, shattered that bone and wounded the lung. A good deal of hæmorrhage took place from the external wound. A frothy mixture of blood and air came through the wound, and the patient coughed up some clots. On admission, one hour after the accident, the patient was suffering much from shock. He was put into bed, and efforts at finding the bullet having completely failed, the external wound was dressed with carbolic lotion ($\frac{1}{10}$), the arm put in a sling and bandaged to the side, to keep the broken bone in position.

The next day the patient felt better, and the effects of shock rapidly passed away. There was an area of tenderness at the margin of the trapezius muscle, where the bullet might possibly be lying deeply seated, but as its position could not be fixed exactly, it was not considered expedient to cut down upon it. There was some emphysema of the subcutaneous areolar tissue of the neck and shoulder. The hæmorrhage ceased. On the third day the temperature had risen to 100°.4, but the wound looked healthy. From that date the patient rapidly improved, and was discharged from the hospital, at his own request, on the 5th February, but continued to attend as an out-patient. Before the middle of March he felt perfectly well, the fracture had thoroughly united, and his arm was strong and useful. The only sign of the external wound was a small cicatrix. He had neither pain nor tenderness anywhere, and the position of the bullet all this time one cannot with certainty affirm.

SATO KANA, a Japanese female, aged 26, was shot on the same evening as the previous case. The revolver was fired very close to her body, and the bullet entered at a spot on the outside of the upper arm $1\frac{1}{2}$ inch above the elbow-joint. Failing to detect the foreign body with a probe, the arm was put upon a splint and bandaged. Several attempts were made to find the ball, but without success. The patient left Amoy shortly afterwards. Her friends report that she does not now suffer in any way from her accident.

Dr. J. POLLOCK's Report on the Health of Swatow for the Year
ended 31st March 1883.

THE foreign residents have enjoyed extremely good health during the past twelve months. Only one death occurred,—that of an infant, aged two weeks, from enteritis. There have been seven births.

All were normal, with the exception of one case, in the seventh month. Here the amniotic fluid began to escape, without apparent uterine action, two weeks before labour set in. In spite of absolute rest in the recumbent position, every drop of fluid came away before labour commenced, the outlines of the child being distinctly traceable through the abdominal walls in a transverse position. The breech presented, and a very quick labour resulted in the birth of a female child, who did well.

Four of the births occurred in the warmest part of the summer.

These four children were, very soon after birth, attacked by a skin affection, which presented all the appearance of pemphigus. The head, neck and trunk were the only parts affected, and it readily yielded to the application of zinc ointment, and did not recur. In two of the families the elder children were attacked.

A very obstinate dermatitis was set up by the application of an ointment composed of one part of araroba to eight of lard, in a gouty subject, which was cured only by change to a northern climate.

An elderly man had an attack of renal colic. Some months after, he complained of a "stricture," on account of a sudden difficulty in urinating. I succeeded in passing a No. 6 catheter beyond an obstruction in the middle of the urethra, which communicated a grating sensation to the instrument. Its withdrawal was followed by a few drops of blood, and on that evening, while micturating, the patient passed a small calculus, which had become impacted in the urethra. This was followed by complete and permanent relief.

The usual amount of simple fever occurred, in most cases traceable to exposure to the sun, the temperature in one case reaching 106°.4, with delirium.

Summer diarrhoea was almost absent, only two or three cases occurring.

Among the Chinese the summer proved an exceptionally sickly one, which they attributed to the remarkably long absence of rain, little, if any, falling for about 22 weeks. Fever of a fatal nature was very prevalent, and as the native physicians here cannot treat it very successfully, the populace mainly resorted to the temples. There was also a rather serious outbreak of cholera, which was said to have been imported. Hydrophobia was very prevalent, and I have heard the number of deaths from this cause in the neighbourhood estimated at 50 or more.

Among the shipping three deaths occurred, one from enteric fever, one from cholera, and one from tubercular diarrhoea.

A sailor on board the revenue cruiser *Ling Feng*, while engaged on some work aloft, fell to the deck and sustained serious injuries, fracture of superior maxilla, fracture of femur, and concussion of the brain. He, however, made a good recovery in less than three months.

Dr. J. F. WALES's Report on the Health of Canton for the Half-year
ended 31st March 1883.

DURING the past half-year the health of the foreign community residing on Shamien has not been satisfactory. The most common diseases have been diarrhoea, neuralgia, and malarial fever. Three cases of acute dysentery and two of enteric fever have been under my care; one of the latter was complicated by the occurrence of intermittent fever.

I have to record two deaths: one of a member of the Customs out-door staff, from accidental drowning; the other of an infant, from diarrhoea and convulsions.

The almost complete absence of rain had, I think, much to do with the numerous cases of sickness that occurred. Water became scarce and of indifferent quality, and the various drains in the city, for want of proper clearing, exerted doubtless a septic influence on the surrounding air.

In the treatment of dysentery I am unable to say that I found ipecacuanha of much service. Its use, I think, causes tormina and tympanites, and consequently adds to the discomfort of the patient. At present I am satisfied with prescribing a saline purgative, followed by opium and belladonna, hot fomentations, and the frequent use of hot water enemas. Tympanites is best relieved by small doses of spirit of turpentine.

A common and troublesome disease is herpes preputialis. Its causation cannot be entirely due to the heat, for it is as frequently met with in the cold as in the warm months. Glycerine of tannic acid generally suffices for its cure, but some obstinate cases require the application of a strong solution of silver nitrate. This trivial ailment sometimes occasions serious consequences. In two cases which lately came under my notice a fringe of herpetic vesicles became converted into indurated sores from exposure to syphilitic infection.

I think that the climate of Canton is very favourable for the treatment of syphilis. The warm humid atmosphere, which keeps us perspiring during the greater part of the year, enables specific treatment to be vigorously pursued without much fear of injurious consequences.

In the *American Journal of the Medical Sciences* for April 1882, page 359, there appeared a paper by Dr. M. K. TAYLOR advocating the use of carbolic acid and pressure in the treatment of inflamed lymphatic glands. I was favourably impressed by the details given, and determined, when opportunity occurred, to give the method a trial. In two cases I have applied this treatment with success. I injected 20 minims of a $\frac{1}{10}$ solution of carbolic acid into the centre of the inflamed gland, and applied firm pressure. In one case the gland was much enlarged, the skin covering it reddened, and the pain great and throbbing—in fact, I was almost certain that suppuration would occur; but after one injection the pain quickly ceased, the other signs of inflammation gradually abated, and the gland is now slowly becoming reduced in size.

The following abstract of meteorological observations has been prepared by Mr. GÜNTHER, Harbour Master:—

ABSTRACT from the CUSTOMS METEOROLOGICAL TABLES from October 1882 to March 1883.

MONTH.	WINDS.							WEATHER.			BAROMETER.				THERMOMETER.			
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.	Average Hourly Force.	No. of Days Fog.	No. of Days Rain.	Rainfall in Inches.	DAY.		NIGHT.		DAY.		NIGHT.	
											Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.	Highest Reading and Average Highest.	Lowest Reading and Average Lowest.
											Inches.	Inches.	Inches.	Inches.	°	°	°	°
1882.							miles											
October	7	17	2	1	4		4.92		1		{ 30.15 30.04	29.81 29.96	30.11 30.01	29.82 29.99	92 86	73 79	86 81	72 77
November	27	2		1			6.56		2	1.6	{ 30.32 30.17	29.96 30.09	30.30 30.13	30.00 30.11	86 74	52 67	77 69.5	52 64.5
December	19	1	3	6	2		6.54		1		{ 30.46 30.20	29.94 30.11	30.42 30.18	29.99 30.15	80 68.5	42 58	73 61	41 55
1883.																		
January	19	6	2		4		6.15		1		{ 30.44 30.19	29.72 30.11	30.40 30.15	29.69 30.12	78 67	44 56	70 61	42 54
February	15	6		2	5		6.77		13	.4	{ 30.31 30.15	29.93 30.08	30.31 30.12	29.94 30.09	79 62	42 55.5	73 58.5	41 55
March	17	8			5	1	6.58		12	12.6	{ 30.16 30.06	29.76 29.98	30.13 30.03	29.76 30.00	79 65	54 60.5	73 62	54 60

REMARKS.—During October, rain fell on 1 day only, against 4 days, measuring 4.3 inches, in the corresponding month of last year. During November, rain fell on 2 days, measuring 1.6 inches, against 11 days, measuring 1.5 inches, in the corresponding month of last year. During December, rain fell on 1 day only, against 6 days, measuring 1.7 inches, in the corresponding month of last year. During January, rain fell on 1 day only, and the quantity was so little that the gauge did not record it. During February, rain fell on 13 days, measuring $\frac{3}{4}$ inch. During March, rain fell on 12 days, measuring 12.6 inches, against 9 days, measuring $2\frac{1}{2}$ inches, in the corresponding month of last year.

During October, the prevailing winds were from the S.E.; the strongest was recorded on the 11th, averaging 9 miles per hour during 24 hours. During November, the prevailing winds were from the N.E.; the strongest was recorded on the 3rd, averaging $11\frac{1}{2}$ miles per hour during 24 hours. During December, the prevailing winds were from the N.E.; the greatest force was recorded on the 31st, averaging 15 miles per hour during 24 hours. During January, the prevailing winds were from the N.E.; the strongest was recorded on the 30th, averaging 12.07 miles per hour. During February, the prevailing winds were from the N.E.; the strongest was recorded on the 24th, averaging 12 miles per hour during 24 hours. During March, the prevailing winds were from the N.E.; the strongest was recorded on the 4th, averaging 9.46 miles per hour during 24 hours.

Dr. E. A. ALDRIDGE's Report on the Health of Hoihow for the Year
ended 31st March 1883.

ABSTRACT of METEOROLOGICAL OBSERVATIONS taken at the Custom House during the Year
ended 31st March 1883. Latitude, $20^{\circ} 3' 13''$ N.; Longitude, $110^{\circ} 19' 3''$ E.

MONTH.	WINDS.						MERCURIAL BAROMETER.		THERMO- METER.		No. of Days Fog.	No. of Days Rain.	
	No. of Days N. to E.	No. of Days E. to S.	No. of Days S. to W.	No. of Days W. to N.	No. of Days Variable.	No. of Days Calm.	Average Hourly Force.	Highest and Average Highest.	Lowest and Average Lowest.	Highest and Average Highest.			Lowest and Average Lowest.
1882.							Miles.	Inch.	Inch.	°	°		
April.....	12	10	...	1	7	...	2	30.22	29.81	87	67	...	5
May.....	11	8	...	2	10	...	3	30.01	29.94	80	75	...	10
June.....	22	...	3	2	3	...	2	30.07	29.75	90	78	...	15
July.....	14	9	4	3	1	...	2	29.93	29.85	86	81	...	13
August.....	6	2	16	2	5	...	3	29.98	29.68	89	80	...	12
September.....	22	1	3	1	3	...	3	29.85	29.79	86	82	...	11
October.....	27	2	...	2	...	...	2	29.99	29.65	89	79	...	9
November.....	28	...	...	1	1	...	4	29.81	29.79	85	81	...	9
December.....	31	...	...	...	...	...	3	30.04	29.59	87	76	...	2
1883.								29.87	29.75	83	80		
January.....	26	5	...	...	...	...	2	30.03	29.76	85	78	...	0
February.....	16	11	...	1	...	...	2	29.94	29.88	83	80	...	6
March.....	25	...	3	3	...	...	3	30.10	29.90	84	77	...	12
								30.02	29.99	82	78		
								30.33	29.87	81	63		
								30.16	30.10	72	72		
								30.50	30.10	73	51		
								30.22	30.16	66	63		
								30.49	29.85	74	53		
								30.22	30.16	65	62		
								30.30	29.97	81	52		
								30.17	30.09	67	63		
								30.17	29.80	79	62		
								30.07	30.00	72	68		

The year under review was remarkable for the almost complete absence of high winds. During the autumn this part of Hainan rarely escapes the visitation of several very heavy gales, more or less approaching typhoons in character. From the 8th till the 11th November a strong north-east wind, accompanied by very heavy rain, was experienced, causing a freshet in the river, with overflowing of the banks, and for a few days preventing all communication with the anchorage. The floods that then took place were very serious, for the autumn crop of rice which was growing in the low-lying districts was ready for reaping, and the crop was greatly injured—in some districts was completely destroyed. The lowest reading of the barometer during this blow was 29.87 inches. The summer, as is always the case here, was very long, and for quite six months the thermometer, in rooms above the ground floor, at

one time of the day registered 90° F. On account of the cool situation of the thermometer from which the readings are taken at the Custom House, at least four degrees should be added to those given above for the summer months, in order to represent the temperature of the dwelling-rooms occupied by the foreign residents during that period. The winter was attended by little rain. December was unusually fine, while we had not a single wet day in January. For 38 days, rain fell on one occasion only. The early morning and part of the afternoon, however, during the last few months have so very frequently been attended by foggy or hazy weather as to somewhat mar the pleasure of out-door exercise. I believe few places in the world are visited with such regularity during a certain season of the year by severe thunderstorms as Hoihow. There is a storm nearly every other day during May and three following months between the hours of 1 and 4 P.M.; it most frequently arrives from the westward, and lasts for about an hour, the remainder of the day being fine. It is very rare to have rain in summer unattended by thunder and lightning; in winter, however, we are almost entirely free from such storms. The heavy rain that then falls has a very beneficial effect, for the drains are well flushed and some of the street refuse is washed away, while the temperature falls for a short time a few degrees. These storms seem peculiar to the north coast of the island; though in other parts there is a heavy rainfall, it is not so frequently attended by thunder and lightning. The south-west wind that blows with such regularity on the coast of China during the summer season does not do so in the Straits of Hainan; only on 26 days was that wind experienced here, while there was a northerly direction in the wind on 258 days. On the 21st December the thermometer stood at 51° F., the lowest for nearly five years; on the 19th January 1878, 49° was registered.

I am sorry to have to report a great amount of sickness among our small foreign community, which now numbers 12 individuals. There have been several cases of a serious nature, notably one case of typhoid fever, one of cholera, one of remittent fever, and one of chronic dysentery. Few have escaped with less than two or three attacks of fever of an intermittent character; in fact, nearly all the cases of sickness can be classed under the heading of preventable disease, in the sense of their being only attributable to local and climatic causes. There has been one death, and three or four persons have had to return to Europe on account of their being unable to continue residence here; while more than one of those remaining would be greatly benefited were they to do likewise. Residence here during the winter is not unhealthy, and is even enjoyable to those fond of out-door sports, but I cannot say the same of the summer, which, on account of its great length, is very trying to the strongest constitutions. It is to be feared that Hoihow will have gained the unenviable notoriety of having been the most unhealthy of all the ports during the last year. That the houses and their abominable surroundings are in the main responsible for this, no one can for a moment doubt; and while foreigners inhabit these houses, a like result is to be feared. At present they live in Chinese houses, burdened with all the loathsome insects and reptiles that are always, in the East, found to collect in old buildings. As these houses are not detached, side ventilation is completely cut off. The drains running through them are of the rudest description, and the houses would be much healthier without them, for they are formed merely of insufficiently baked porous bricks and tiles, joined with chunam.

They are laid on a very slight incline, and are frequently choked, while, as they are far from being watertight, a large amount of what is poured into them finds its way into the surrounding soil; hence nothing but constant flushing and a plentiful use of disinfectants prevents their breeding disease. At the back of most of the houses is a tidal creek, into which the drains of all houses and streets along the bank open. At the front is a narrow, filthy street, the roofs on each side of which are joined by matting, which, though affording great protection from the sun to pedestrians, confines the emanations arising both from the badly constructed main sewer that runs under the pathway and from the garbage that is thrown into the street. As the town is built on ground little higher than the creek, there is hardly any fall for sewage.

The cold stage in the cases of intermittent fever among foreigners was usually of very short duration. When attending a case of remittent fever I had the opportunity of proving the efficiency of Leiter's pliable metal spiral cap for applying cold to the head. The patient one night became delirious, with a temperature of 103°, and although the temperature of the water used was 65° F., in about an hour the delirium ceased, consciousness was regained, and the patient fell into a quiet sleep, from which he woke much better. Leiter's temperature regulators will, I am sure, be most useful in hot places like this, where it is impossible to obtain ice. The fatal case referred to above was one of cholera, and differed but little from the cases I reported after the outbreak of cholera among the natives during the summer of 1881.*

14th August 1882.—A. B., merchant, aged 32, a slightly-built man of delicate constitution. Had spent many years in Sumatra. The house in which he had resided for eight months was in the most unhealthy quarter of Hoihow; there had been two deaths from cholera in the same street the week previous; in front of the house was a stagnant pond, and the drains were in a bad state. He went to bed the night before, feeling well, and slept until about 4.30 A.M., from which time he had frequent attacks of purging and vomiting; but up to 7 A.M. he was strong enough to go downstairs to the closet. I received a few lines from him a little before 9, and upon my arrival shortly afterwards, found him in bed, suffering agony from cramp in legs and arms. There was insatiable thirst, frequent retching and feeble circulation; all the symptoms of a severe attack of cholera being present. Large mustard poultices, bottles of hot water all about him, and morphia, gave great relief. At about 10.30 the vomiting and purging ceased, but he was excessively weak, and fainted twice. At 2 P.M. there seemed very good hopes of recovery; the temperature of the body rose; profuse perspiration broke out; there was no purging; he was able to keep down some stimulants and extract of beef, and sleep was obtained for a few minutes at a time. At about 4 P.M., however, there was a return of the severe symptoms, with extreme prostration, the patient being unable to raise his hand to his mouth or speak above a whisper; consciousness was retained up to the time of death, which occurred at dusk. An hour before this he suffered a great deal from a sharp pain, which went from the heart through to the back; the breathing was then laboured, and the pulse almost imperceptible. Before being seized by cholera, this man had passed through a mild attack of typhoid fever, from which he had only been convalescent about three weeks; and had it not been for this, I have reason to believe recovery might have ensued. In cases like this I have always found the hypodermic injection of morphia beneficial.

In comparison with previous years, there is little doubt that Hoihow and Kiungechow, during last summer, were very free from cholera, and there were, I understand, far more cases in many of the other ports up the coast. In Hoihow itself, it is very doubtful whether

* Customs Medical Reports, xxii, 6.

there were in all half a dozen fatal cases. As far as I could gather, after making careful inquiries, there were only three, all occurring in Chéntung Street, where A. B. resided. Shortly after these deaths the port was twice declared infected by the Hongkong authorities, viz., from the 23rd August to the 9th September, inclusive (or 18 days), and from the 3rd to the 8th October, inclusive (or six days), and vessels were placed in quarantine for as long as 10 days from the date of leaving Hoihow. During the summer of 1881 cholera was very prevalent at this port, about 300 deaths occurring. At the end of 1881 and early part of 1882, cholera was prevalent at Samah, a small trading place at the extreme south of Hainan. This place at the time happened to be the headquarters of the Taotai's troops carrying on operations against the Li aborigines, and many succumbed to the disease. In the spring of 1882 cholera appeared in the Tamchou district; and Yangpu, a fishing village in that district, after many had died, was completely deserted by its inhabitants. Tamchou, a very important town on the north-west coast, was attacked; the old people living near the South Gate were, I am told, those who suffered most. It is curious to note that the disease first broke out in the south, and then followed the road along the west coast to the north of the island, visiting in its course many of the villages, while inland places and the districts on the east coast were not visited by cholera at all.

In the autumn there are always a great many cases of malarial fever at Hoihow, but last autumn there were many more than usual. In the Wénchang district, since the floods that occurred in November last, there has also been a great deal. Only a few merchants live in two-storied houses, the poor living in wretched hovels built on low ground; these are destitute of drains and of wooden or tile flooring. In wet weather the mud forming the floor becomes soft and slushy; the occupants have only a charcoal stove to dry the house; they often place the boards on which they sleep only a few inches from the ground, while they have not yet learned that a damp, dirty dwelling is not conducive to good health. Malaria is usually expressed by the natives as the wind of the Lis (黎風), from the belief that it has its origin in the districts inhabited by the Li aborigines. In Hoihow there is a temple dedicated to CHIANG CH'I-LUNG (江起龍), a general who did good service for the Chinese against the Lis. In the hands of a figure representing one of the general's lieutenants is a long chain; this chain was last autumn nearly every day borrowed from the temple, and good results were said to accrue from placing it round the necks of sufferers from ague. Considering the unhealthy surroundings in which the poor exist, and the spare diet that supports them, it is rather to be wondered at that there are not more cases of fever than there are.

About the only foreign medicine that the natives here have any faith in is quinine, and one foreign firm does a good business in that drug. A great quantity of what finds its way into the market, though called sulphate of quinine, cannot, judging from its price as well as action, but be of a very inferior or spurious quality, the wholesale price of it being only 25 to 40 cents, and the retail price 80 cents to \$1 an ounce. Without employing chemical reagents, it is often not easy to distinguish this cheap article from the really genuine drug. Under the microscope it shows nearly the same form of crystals, but is much more soluble in water and more acrid to the taste; on the label of some of the bottles the name of no firm is given, while others have the name of a Paris firm of chemists.

The vaccinator WANG, from the Tung'hwa Hospital, Hongkong, who for the last few years has paid a winter visit to this island, has during this last winter done some very good work, having, with the assistance of his son, performed vaccination in Hoihow upwards of 2,700 times; in Kiungchow, 600; and in the outlying villages, 3,200,—in all, 6,500 times. At present he is on a tour through the eastern districts of Hainan. His salary is paid by the hospital; the sum of 100 cash is charged for vaccination, part of which goes to defray the expenses of chair hire, etc., and the remainder is given to the parents of the child from whose arm lymph is taken. For some time past there have been very few cases of small-pox in this part of the island. The year before last, CHANG SHU-SHENG, the late Viceroy of the Liang Kuang provinces, desiring to give employment to a number of petty expectant officials who had nothing to do, and with the belief that some benefit might accrue to the people, established a vaccination station at Canton, had 40 of these men taught vaccination, and then sent them into the 72 districts of Kwangtung, at the same time giving instructions that their salaries were to be paid by the local officials of the districts they visited. Some of these men arrived at Hainan, but did very little service; the people would have nothing to do with them, and they soon had to return to Canton.

The community here is much indebted to Mr. H. McCALLUM, member of the Pharmaceutical Society and analyst to the Government of Hongkong, for his great kindness in examining the drinking water. Early in March a sample was forwarded to him, upon which he reported as follows:—

TABULAR STATEMENT of an ANALYSIS made on a SAMPLE of SPRING WATER from HOIHOW, HAINAN.

Free ammonia	0.01 parts per million.
Albuminoid ammonia	0.018 „ „
Phosphoric acid, as phosphates	None.
Nitrogen, as nitrites	None.
Nitrogen, as nitrates	0.0611 grains per million.
Oxygen absorbed in four hours at 80° Fahr.	0.0210 „ „
Chlorine, as chlorides	1.1 „ „
Total solid matter dried at 212° Fahr.	3.8 „ „
Degree of hardness, "Wanklyn's scale"	2.

There was slight turbidity, and on standing a very small quantity of sediment was deposited. The supernatant water was clear, bright, and pleasing.

Mr. McCALLUM further wrote that—

The analysis shows it to be a very good water, and admirably suited for domestic purposes. With regard to organic impurity, it compares very favourably with the purest of natural waters. The amount of mineral matter in solution is low,—unusually so for a spring water. With regard to filtration, any water containing matter in suspension ought to be filtered before it is used for drinking purposes. This water contains very little suspended matter, but there is some, and it ought to be filtered. With regard to boiling, judging from the chemical analysis alone, I am of the opinion that boiling is not necessary; on the contrary, it is harmful, inasmuch as it will make a pleasant water flat and insipid. It must, however, be remembered that chemical analysis is not everything; and if the well is liable to be at any time polluted by surface or subsoil drainage, then boiling would be a wise precaution in a country where dysentery is more or less common. A point much neglected in the East is the method

of drawing the water. Coolies are usually allowed to perform this duty just as they please. They are careless and dirty, and the consequence is the well gets contaminated in various ways. Unless a well is properly constructed, and the water drawn from it in a proper manner, there must always be considerable danger of the water getting polluted.

The analysis given above is of the water from the White Jade Spring (白玉泉), which is about half a mile from the town. This spring has always been considered by the natives, as well as by myself, to furnish the purest water in the neighbourhood; and even in seasons of drought, when water from other sources has been scarce, the supply from this spring has not lessened. I may here mention that those who were attacked with typhoid fever and chronic dysentery did not obtain water from this source. Though I had made frequent examination of this water, on account of the risks run in a climate like that of this place, I believed a trustworthy report from a competent analyst to be a desideratum, for, as Mr. McCALLUM pithily remarks in his last report on the Hongkong water, "drinking water, like CÆSAR'S wife, should be above suspicion." Since the sample of water analysed was drawn, the spring, at some little expense, has been much improved, and it is now possible to obtain water without the least turbidity, and without sediment on standing. The remarks with reference to water coolies are very appropriate, for they here much want looking after, or the risk is run of their not going to the proper spring, but to one of those nearer the town. The buckets require frequent attention, as well as the utensils used in drawing the water. The water kong also often needs cleansing, as in a hot climate the inside soon becomes slimy and dirty, and should be emptied every day, and refilled with a fresh supply. Too much attention cannot be paid to such a very important thing as drinking water. All the uncultivated land near the town is used as a burial ground, and Pai-yü Spring, like the others in the immediate neighbourhood of Hoihow, is near graves. In my opinion, however, drinking water obtained from near a graveyard in China may be very different from that taken from near a European graveyard, for in the latter case the water is much more liable to pollution than in the former. A European coffin is often made of soft-wood planks, lightly screwed together, while the wood forming a Chinese coffin is the hardest procurable, and some inches thick, the planks being dovetailed together; the corpse is often wrapped in cotton wool an inch or so thick, and the coffin filled up with lime, and cemented inside and out with chunam, thus making it completely watertight. Everyone can bear witness to the odour emitted by a European coffin within a few days, but such is never the case in China, where the temperature is often so much higher. The coffins here are frequently left for weeks without burial, but in such cases I have never detected any offensive smell,—which is due to the fact of the corpse becoming dust without any poisonous oozing from the coffin. Even though I think the Pai-yü Spring runs little risk of being contaminated on account of being near old graves, it is very advisable that for the future there should be no burials near. If this point is attended to, there is not likely to be any risk of contamination, for all danger, if there ever was any, is now, I believe, passed, there having been no interments near the spring for some time.

It is believed by the natives of this place, as well as by those of other parts of the Kwangtung province, and I daresay throughout all China—a Pekingese informing me that he has heard of cases occurring in the capital,—that there is a curious, but not uncommon,

disease, often proving fatal, the most prominent symptom of which is shrinking of the penis; hence the common name *so-yang-chêng* (縮陽症), the disease of the contracted penis. Here the belief in this disease is universal, every native knows of it, and when asked to describe it, gives the same account. It is said most frequently to come on after sexual intercourse, but a man may be attacked by it at any other time. After the penis has once begun to shrink, if proper measures are not promptly taken, the sufferer becomes insensible, and the penis recedes into the belly, and remains there even after death, which soon takes place. The treatment first to be adopted is to lay hold of the penis and draw it out; this is most frequently done by means of the ordinary Chinese scale-box, the two halves of which are made to act as a pair of tongs or pincers, while the sliding ring round the handle tightens the grip as necessary. The end of the spine is cauterised with artemisia moxa, acupuncture is performed with silver needles, and the penis bathed with hot strong samshu. I am also told of there having been cases of contraction of the female breasts, the disease being known as *so-nai-chêng* (縮奶症). The following is a short summary of a paragraph that appeared in the 9th March issue of the *Chinese Mail*, a native paper published in Hongkong:—

There resided in Paohsien Street, in the western suburbs of Canton, a man named CHUANG, who was in the prime of life, being nearly 40 years of age. Last autumn, after winning several thousand dollars in the Weihsing lottery, he cohabited with a concubine, from which time he began to lose health. On the night of the 5th March he retired to rest, feeling the same as usual, but during the night was attacked by the *so-yang* disease, and became insensible. The concubine was not aware of the fact until the next morning, when medical assistance was called in; the doctor pronounced the case hopeless, and at the same time stated that had advice been sought earlier, a cure might have been effected.

I should not think it worth while referring to these empirical vagaries were it not for the fact that a case has come under my observation in which the belief in the disease led to rather unpleasant consequences. In January last I was visited by a petty native official, who informed me that three days previous he had arrived from Haiphong, that on coming ashore he felt chilled, and had some pain in the bladder, and that the penis began to shrink.

The same night, as he greatly feared that it might recede into the belly, to prevent its doing so he put a jadestone thumb-ring round it, but the next morning was unable to draw off the ring. On examination I found the thumb-ring near the root of the penis; the organ in front of the ring was greatly swollen, being $4\frac{3}{4}$ inches in circumference, and quite cold, the glans was of a dark colour, and the skin tense and shining, and mottled with extravasated blood, showing all the signs of commencing mortification, the constriction having lasted for about 65 hours. After winding tape round the penis and passing one end under the ring by means of an eyed probe, and then untwisting the tape, I moved the ring forward about $1\frac{1}{2}$ inch, but by so doing considerably increased the swelling in front of the ring. However, after making numerous punctures and letting out some blood and serum, by making steady pressure, in an hour or so the ring was removed; lint, spread with zinc ointment, was wrapped round the penis, and in a few days it regained its proper form.

This man, before consulting me, had been to the native doctors, who told him that the only means of removing the ring was by breaking it. As the ring was of jadestone, which is of extreme hardness, and was $\frac{1}{2}$ inch thick and $1\frac{1}{16}$ inch broad, this procedure could not have been accomplished without a very heavy blow with a hammer, and would most probably

have seriously injured the organ. Besides, as the value of the ring was \$17, the man was naturally very anxious to get it removed unbroken. He told me that six months previous, on the day of arriving at Pakhoi, the penis shrank, and that he then made use of a scale-box to draw it out; he further intimated to me that for the future he should keep one of these boxes at hand for his requirements. I know of more than one instance of men always carrying in the pocket a scale-box specially made for the purpose; while my assertion that there is no such disease as that which they fear, obtains no credence.

Dr. J. H. LOWRY'S Report on the Health of Pakhoi for the Half-year
ended 31st March 1883.

THE general health of this port for the past six months has been very good. Both foreign and native communities have been spared any epidemic or dangerous sickness, and the death rate among the natives has been very low.

The winter began on 3rd November with a strong northerly gale, and since Christmas the weather has been singularly cold for this latitude, there being frequent gales from the north. Till the middle of March I may say no rain fell, but since that time a considerable amount has fallen. It was much needed both for farming and cleansing purposes.

The following is a list of some of the cases treated from October to March :—

Pleuritis	1	Syphilitic psoriasis	1
Sub-acute bronchitis	1	Scalp wound	1
Epididymitis	1	Incised wound of buttock	1
Keratitis	2	Palmar abscess	1
Acute conjunctivitis	2	Rupture of membrana tympani	1
Chronic „	20		
Bell's facial palsy (with marked syphilitic history)	1		

In my former Report I spoke of the healthy climate of this place in summer, and now it is only left for me to add that I find the winter climate equally healthy and invigorating. Possibly the very weak might find the variations in temperature trying, but with certain precautions I consider the most delicate might live here with great benefit.

My temperature readings, appended, for the six months ended 31st March will give some idea of the climate.

MONTH.	THERMOMETER.						Days on which Rain fell.
	Highest by Day.	Lowest by Day.	Highest by Night.	Lowest by Night.	Average Day.	Average Night.	
1882.	° F.	° F.	° F.	° F.	° F.	° F.	
October	86	75	85	70	83	74	2
November	84	55	80	50	70	62	6
December	76	40	74	39	65	55	2
1883.							
January	72	46	70	43	64	53	2
February	77	39	74	39	58	52	3
March	73	51	71	50	63	57	16

Dr. ALEXANDER JAMIESON'S Report on the Health of Shanghai for the
Half-year ended 31st March 1883.

ABSTRACT of METEOROLOGICAL OBSERVATIONS taken at the Observatory of the Jesuit Mission
at Sicawei, for the Six Months ended 31st March 1883. Latitude, $31^{\circ} 14' 32''$ N.
Longitude E. of Greenwich, $121^{\circ} 29' 8''$.

DATE.	Barometer at 32° F.	THERMOMETER.		Elastic Force of Vapour estimated in Inches of Mercury.	Hu- midity, 0-100.	Ozone, 0-21.	Velocity of Wind per Hour.	Mean Direction of Wind.	Total Evaporation during Month.	Total Rainfall during Month.	REMARKS.	
		Diurnal Mean Temperature in Shade.	Extreme Temperature in Shade.									
1882.	Inch.	° F.	° F.	Inch.			Miles.		Inch.	Inch.		
Oct.....	Max...	30.301 (13)	72.1	82.8 (5)	0.764	90 (27)	18	19.9 (20)	N. 36° E.	2.595	0.855	Twelve days rain.
	Mean...	30.054	66.1	...	0.508	79	11	6.8				
	Min...	29.837 (7)	61.5	53.6 (14)	0.291	68 (23)	7	0.9 (15)				
	Range	0.464	10.6	29.2	0.473	22	11	...				
Nov.....	Max...	30.548 (10)	55.9	67.6 (6)	0.559	95 (15)	21	23.8 (25)	N. 12° E.	1.922	4.147	Eighteen days rain. On the 5th, first hoar frost. On the 26th the thermometer indicated the freezing point for the first time. On 12th, 13th-17th, 18th and 19th, great magnetic storms.
	Mean...	30.314	51.2	...	0.335	81	12	7.5				
	Min...	30.062 (24)	47.8	30.2 (30)	0.094	68 (25)	6	0.6 (5)				
	Range	0.486	8.1	37.4	0.465	27	15	...				
Dec.....	Max...	30.883 (22)	47.4	63.9 (4)	0.473	97 (30)	19	21.8 (17)	N. 24° W.	2.659	1.016	Ten days rain. Maximum reading of barometer on the 22nd, 1 A.M. On the 12th, first fall of snow.
	Mean...	30.345	40.8	...	0.206	75	12	8.5				
	Min...	29.953 (5)	36.2	19.9 (22)	0.047	54 (22)	6	0.0 (5)				
	Range	0.930	11.2	44.0	0.426	43	13	...				
1883.												
Jan.....	Max...	30.634 (5)	43.0	58.1 (23)	0.441	97 (24)	20	27.7 (29)	N. 46° W.	3.090	0.599	Eight days rain.
	Mean...	30.329	35.9	...	0.168	75	12	8.7				
	Min...	29.630 (29)	31.1	15.6 (19)	0.016	44 (18)	7	0.0				
	Range	1.004	11.9	42.5	0.425	53	13	...				
Feb.....	Max...	30.580 (26)	42.3	59.0 (14)	0.441	94 (13)	21	18.7 (12)	N. 8° W.	1.871	3.579	Fifteen days rain.
	Mean...	30.316	38.5	...	0.198	82	13	8.2				
	Min...	29.965 (15)	35.5	22.7 (3)	0.067	62 (2)	5	0.0				
	Range	0.615	6.8	36.3	0.374	32	16	...				
March...	Max...	30.356 (31)	54.9	72.5 (18)	0.429	88 (1)	20	24.3 (22)	N. 58° E.	0.404	2.245	Eight days rain.
	Mean...	30.148	47.7	...	0.236	72	13	8.5				
	Min...	29.651 (19)	41.8	30.7 (16)	0.098	59 (15)	4	0.6 (10)				
	Range	0.705	13.1	41.8	0.331	29	16	...				

NOTE.—The figures in parentheses indicate the days on which the observations to which they are appended were made. Note that under the heading "Humidity" the maxima and minima registered are the diurnal mean maxima and minima; in other words, they correspond to the two days of the month whereon the humidity was respectively greatest and least during the 24 hours.

The above abstract has, with his usual kindness, been made by the Rev. MARC DECHEVRENS, S.J.

BURIAL RETURN of FOREIGNERS for the Half-year ended 31st March 1883.*

CAUSE OF DEATH.	OCTOBER.	NOVEMBER.	DECEMBER.	JANUARY.	FEBRUARY.	MARCH.	TOTAL.
Small-pox .....	...	...	1 ††	1 †† †† § ††	1 †† § ††	1 †	10
Measles .....	...	...	1 †	...	...	...	1
Typhoid fever .....	...	...	...	1 †	...	...	1
Puerperal fever .....	...	...	...	1 †	...	...	1
Hydrophobia .....	...	...	...	...	1	...	1
Syphilis .....	...	...	1	...	...	...	1
Chronic interstitial nephritis .....	...	...	...	...	1	...	1
Diphtheria .....	...	1 ††**	1 †**	...	...	...	2
Cholera	1 †† 1 †† ††	...	...	...	...	...	4
Debility .....	...	...	1 ¶	...	...	...	1
Infantile marasmus .....	...	...	1 ††	...	...	...	1
Cancer of tongue .....	...	...	...	...	...	1 ¶	1
Fatty degeneration of heart and liver..	1	...	...	...	...	...	1
Fatty degeneration of heart .....	...	...	...	...	1	...	1
Phthisis	1	1 ¶ ††	1 †† ††	...	...	...	5
Cerebral hæmorrhage .....	...	...	...	1 †	...	...	1
Delirium tremens .....	...	1 †	...	...	...	...	1
Cerebral meningitis .....	...	...	...	1 †	...	...	1
Convulsions .....	...	...	...	1 ††	...	...	1
Aortic aneurism .....	...	...	...	...	1	1	2
Syncope .....	...	1 †	...	...	...	...	1
Heart disease .....	...	...	...	...	1 †	...	1
Pneumonia .....	...	...	...	...	2	...	2
Dysentery .....	...	1 †	...	...	...	1 ¶	2
Diarrhoea	1 ¶	1 †	...	...	...	...	2
Intussusception .....	...	1 ¶	...	...	...	...	1
Hepatic abscess	1	1	...	...	...	...	2
Suicide .....	...	...	...	...	...	1 † §§	1
Fracture of skull .....	...	...	...	1	...	...	1
Drowned	1	...	...	...	...	1	2
Uncertified	1 † 1 ¶	1 † 1	...	...	1 †	...	5
TOTAL	11	11	9	10	11	6	58

* Not including deaths among the Catholic religious bodies, among Eurasians, or Japanese; exclusive also of still-births.

† Not resident (12).

‡ Infants (6).

** 7 years old.

†† Mexican.

‡ Natives of Macao (10).

¶ Natives of Manila (6).

†† Native of Mauritius.

§§ Bullet wound of heart.

§ Unvaccinated (2).

Subtracting 1 case of suicide, 1 of accident, and 2 of drowning, there remain 54 deaths to be attributed to disease. Of these, 6 occurred among infants. The foreign adult mortality was thus 48, as against 46 in the corresponding period of 1881-82.

Analysing the deaths, as I have been accustomed to do, we get the following results:—

CAUSES OF DEATH FROM DISEASE among RESIDENT EUROPEAN ADULTS.

Small-pox	4 (1 female).	Fatty degeneration of the	} 1
Measles	1 (female).	heart and liver . . .	
Hydrophobia	1	Delirium tremens . . .	1 (female).
Syphilis	1	Aortic aneurism . . .	2
Chronic interstitial nephritis	1	Syncope	1 (female).
Diphtheria	1 (little girl).	Pneumonia	2
Cholera	1	Dysentery	1 (female).
Phthisis	1	Hepatic abscess . . .	2
Fatty degeneration of the heart	1	Uncertified	3 (2 females).

17 males and 8 females, the number for the previous corresponding period having been 16 males and 7 females.

The case of diphtheria, although occurring in a child 7 years old, is included in this table, inasmuch as diphtheria cannot be considered as strictly a disease of childhood, and as the age of 7 is outside the limits of "infancy."

CAUSES OF DEATH FROM DISEASE AMONG NON-RESIDENT EUROPEAN ADULTS.

Small-pox	2 (1 female).	Phthisis	2
Typhoid fever	1	Cerebral meningitis	1
Cholera	2	Heart disease	1

8 males and 1 female.

CAUSES OF DEATH FROM DISEASE AMONG EUROPEAN INFANTS.

Diarrhœa	1	Intussusception	1
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2 males.

CAUSES OF DEATH FROM DISEASE AMONG NON-EUROPEAN ADULT FOREIGNERS.

Small-pox	2 (natives of Macao).	Phthisis	1 (native of Manila).
"	1 (native of Manila).	"	1 { (native of Mexico,
Puerperal fever	1 (female, Macao).	"	1 { non-resident).
Diphtheria	1 (" ").	Cerebral hæmorrhage	1 (native of Macao).
Cholera	1 { (native of Mauritius,	Dysentery	1 { " Manila).
"	1 { non-resident).	Uncertified	1 (" ").
Debility	1 (native of Manila).	"	1 (" Macao).
Cancer of tongue	1 (female, Malay).		

11 males (2 non-residents) and 3 females.

A case of diphtheria is included in this table for the same reason as that above assigned. The fatal case of small-pox in a Manilaman, and one of the two cases fatal in natives of Macao, are specially noted on the certificates as unvaccinated; and I am told that a third fatal case (an Englishman) was also unvaccinated.*

CAUSES OF DEATH FROM DISEASE AMONG NON-EUROPEAN FOREIGN INFANTS.

Small-pox	1 (Macao).	Infantile marasmus	1 (female, Macao).
Diarrhœa	1 (").	Convulsions	1 (" ").

2 males and 2 females.

Small-pox was very prevalent and very fatal. Ten deaths were due to it, or 20.83 per cent. of the total mortality from disease.

Notable improvements in construction and in internal arrangements have recently been introduced at the General Hospital, but in every respect, except as regards nursing, which leaves little to be desired, the provision made for the treatment of small-pox patients is still, as it has always been, scandalously bad. Three or four Chinese hovels standing in a row close

* According to Dr. BÄRLZ (*Mittheilungen der deutschen Gesellschaft für Natur- und Völkerkunde Ostasiens*, 1882, No. 27), vaccination is now so rigorously enforced by the Japanese Government that in 1881, out of one million inhabitants in Tokio, there were but two cases of small-pox. I take this citation from an article by Dr. REMY (*Archives Générales de Médecine*, 1883, i, 513), in which much curious information about disease and disease prevention in Japan is to be found. Consult also, for the history of vaccination in Japan, a valuable article in the *Journal de Thérapeutique* de A. GUELLER, 1882, p. 441, by Dr. L. ARBOUX, Médecin-major of the *Kersaint*.

to and in a line with the central block of building are, not without a touch of quaint and grim humour, dignified with the name of "small-pox wards." To enumerate all the grounds of their unfitness for the purpose to which they are applied would be a hopeless task. I will mention only one or two of the more striking. The amount of space devoted to the patients is startlingly insufficient. In such a disease as small-pox the overcrowding of wards is specially to be condemned, yet on more than one occasion during last season, when I remonstrated against two patients being kept in a room too small for one, I was informed that the only alternative was to refuse patients or to pack them together. There is no means of ventilating any room except by opening the window and door, or the window and a revolving sash placed over the door, which, by the way, is seldom or never in working order. But inasmuch as the door and window stand exactly opposite one another, while there is no space for a bed anywhere but close to one or the other, this primitive device is impracticable in cold or wet weather. In summer the heat is intolerable, and in winter, when the low temperature renders artificial warming indispensable, stoves are set up, which add seriously to the impurity of the air in necessarily closed rooms, while they do nothing towards carrying foul currents into the open. It is obvious, therefore, that a small-pox patient sent to the General Hospital is placed under conditions which appreciably diminish his chance of escaping death.

A case lately became notorious in which a patient admitted to the general wards contracted small-pox therein after a period more than sufficiently long to negative the supposition that he had received the infection outside. And this instance is by no means singular, although for obvious reasons such unfortunate occurrences are kept as quiet as possible. The wonder is, however, not that the hospital inmates should on rare occasions acquire small-pox, but that any susceptible persons should escape. The small-pox wards are in no degree isolated from the rest of the establishment. The sister in charge is not separated from the other sisters who superintend the wards occupied by ordinary patients, and who are brought by visits of business or of courtesy into close and frequent relations with the general public. Indeed, there is a constant circulation kept up by the community of nuns between the small-pox quarters and the main establishment, which thus, for all practical purposes, may be considered to be under the same roof. It cannot be too clearly and emphatically stated that there is no isolation, and hardly even a pretence of it. The coolies specially employed about the small-pox patients join the coolies from the general wards a score of times every day for anything I know, but notably in the common kitchen at meal hours, when the patients' food is distributed. They or the sister in charge carry down bottles to the common dispensary, where the contact of infected pill-boxes, bottles, etc., with those destined for patients in the other wards is inevitable. It is thus abundantly evident that it is no light matter for a man with an ordinary ailment to seek shelter in the General Hospital while there are small-pox patients in the special wards. Everything indicates a total failure to realise the importance of a separate establishment for the treatment of so eminently contagious a disease as small-pox, or to form the most elementary idea as to where it ought to be placed, how isolated so as to prevent its becoming a centre of infection, or how constructed and organised so as to prevent its being a means of exasperating a disease already in itself sufficiently dangerous.

A previously healthy man, aged about 30, showed initial symptoms of small-pox on the 28th January. The disease ran a mild course so far as fever was concerned, the highest temperature registered up to the 14th day having been 102°. There was an abundant eruption on the fauces, which rendered deglutition difficult, but milk and broths were taken in sufficient quantity, and strength was well maintained. On the face the pustules were maturing fairly, but on the trunk, and especially on the legs, they presented a withered appearance, which naturally made me apprehensive. On the morning of the 15th day the temperature was found to have fallen suddenly to 98°; the patient was loquacious, and specially emphatic in his protests that there was nothing the matter with him. At noon he was acutely maniacal, requiring three men to hold him down. This condition lasted until the following morning, when quiet was restored. He was then perfectly rational, but much exhausted. Convalescence set in immediately, the temperature never again rising above normal.

In a former number of these Reports* I cited a remarkable example of susceptibility to small-pox contagion. A man who had been three times successfully vaccinated, and had suffered already once from an attack of small-pox, "in which he nearly lost his life," contracted the disease here again, and died of it. The following instance is even more remarkable, as possibly indicating a family predisposition to the disease:—

Out of a family of seven children, four had had small-pox (two of them after vaccination), one had been vaccinated, but had not had small-pox, and two were unvaccinated. One of these latter contracted small-pox in so mild a form that I was doubtful whether it might not be varicella. Four or five days later, however, the other sickened, and passed through a trivial but unmistakable attack. At the same time an elder sister, vaccinated in infancy, and whom I had already three years before attended through a moderately severe attack of small-pox, showed symptoms, and eventually became very gravely ill. Meanwhile a brother, vaccinated, took the contagion in apparently a mild form, giving no ground for anxiety until the end of the second week, when he suddenly threatened collapse. Wine freely administered brought him through this danger, and recovery was then uninterrupted.

Thus all the seven children have now had small-pox. One has had it twice, and two have had it once after successful vaccination.

A case of morbilli gravioris was fatal in December.

A young woman at the end of the fifth month of her first pregnancy became feverish on the 20th December, which she attributed to a cold caught, as she thought, a day or two previous. She sought advice on the 23rd, when she complained of constipation and of recurrent severe pain in the lumbar region, which, however, left her spontaneously for a couple of hours at a time. Late at night on the 25th she miscarried of a dead fetus, and her skin was then, as well as could be made out in a very bad light, covered with a faint efflorescence. Early next morning purplish patches were distributed over the face and entire body; there was severe lachrymation, much lumbar pain, and a temperature of 102°. At 3 P.M. the eruption had retroceded, but the temperature had risen to 103°. The throat was now painful, but restlessness prevented a good view being obtained. Milk was taken freely. Delirium set in during the night. The following note was made on the morning of the 27th. "The rash, which closely resembles that of measles except in colour, is on the limbs confined to the joints and their neighbourhood. Here it is in large purplish patches, with minute vesicles scattered over them. The chest, abdomen, and back are closely covered with patches similar to those near the joints. There is nothing on the forehead, but the nose, cheeks, and chin are covered with a reddish efflorescence, less purple than the patches on the trunk and

* *Customs Medical Reports*, 1, 62.

limbs." Pain relieved. No uterine symptoms. In the evening the lochia, in spite of frequent injections, were offensive; the patches of eruption were everywhere becoming confluent and more livid. Tongue brown and dry; cough and viscid expectoration. Congestion of bases of lungs. On the 28th and 29th, the lochia were natural. Restlessness, and delirium which occasionally became violent, were added to the pre-existing symptoms; headache severe in the intervals of delirium. Petechiae on forearms, legs and back; eruption *gradually becoming less distinct. Breathing superficial over anterior surface of chest, inaudible at apices and over back.* During entire illness nourishment and wine were taken frequently, though in small quantities; but the total amount swallowed was considerable. There was no diarrhoea. Urine was scanty, but contained no blood or albumen. Patient died in the afternoon of the 29th.

The details of the case of diphtheria, fatal in November, were given in my last Report.*

Here it is only necessary for me to remark that during the later autumn and the winter months follicular sore throat was almost epidemic, attacking children, however, chiefly,—at least, within my experience.

In my Reports for 1877 and 1878† will be found a review to date of the modern literature of cholera, and a history of cholera epidemics in Shanghai, so far as it can be constructed from the defective and scattered records of early days. Every year since has witnessed the occurrence of a disease which, though rightly qualified as cholera, bears no relation to any known periodical epidemic wave. The conditions which call it into activity seem to be local and personal. Local, because of their independence of contagion brought from outside or of epidemic waves; personal, inasmuch as almost every case can be in part explained by some avoidable error, dietetic or other‡. It is probable, though not proved, that, once established, the malady is communicable by the intestinal excretions of the sufferers. The mortality is higher than the average mortality of epidemic cholera as deduced from observation elsewhere of large numbers of cases spread over extensive areas. The symptoms are those of cholera in a particularly malignant form; the course is generally rapid, and a fatal termination is the rule, unless the attack be treated in its earliest stage. When advice is sought, as it rarely is, at the very beginning, the symptoms usually yield to judicious treatment. This I have already shown in the Reports above cited, but in such fortunate cases the doubt always remains whether one has really had to do with a form which if neglected would have proved fatal. The course of the disease as observed in Shanghai has been minutely described in the second of the Reports just referred to.

There were but few deaths from cholera in 1877, 1879, and 1880, the numbers having been respectively 4, 3, and 2. In 1878 there were 19 deaths; in 1881 there were 12; and last year (1882) there were 15. These three years were remarkable for the mildness of their summers, for excessive rain during the hot season, and for the frequency of storms. But the differences between the meteorological records of the different years, although noticeable, are not sufficiently marked to justify any conclusion as to a connexion between them and the incidence of a special form of disease. As a general rule, cases begin to be brought into the

* *Customs Medical Reports*, xxiv, 41.

† *Ib.* xiv, 39; xvii, 21.

‡ The fatal case which occurred in September 1882 in the person of a lady recently returned from Europe was distinctly due to an accidental error in diet.

hospitals for Chinese in July, but no fatal case has occurred among foreigners before August or after November.* The figures for the past six years are as follows:—

FOREIGN MORTALITY from CHOLERA in SHANGHAI, 1877 to 1882.

MONTHS.	1877.		1878.		1879.		1880.		1881.		1882.		TOTAL.		
	Rea.	N. Res.	Res.	N. Res.	Rea.	N. Res.	Res.	N. Res.	Res.	N. Res.	Res.	N. Res.	Res.	N. Res.	In all.
August .....	...	...	1	2	2	...	...	...	...	...	1	2	4	4	8
September .....	...	...	2 f 1 †	5 f 1 †	...	...	2	...	1 f 1	5	2 f 1	5	10	17	27
October	1	2	...	3	1	...	...	...	...	5	1	3	3	13	16
November .....	...	1	...	3	...	...	...	...	...	...	...	...	...	4	4
	1	3	4	15	3	...	2	...	2	10	5	10	17	38	55
TOTAL...	4		19		3		2		12		15		51 males, 4 females.		

Serious contributions to the literature of cholera have of late years been few and far between. It seems strange, but is nevertheless true, that amid the vast amount of information regarding almost all diseases, brought forward at the International Medical Congress of 1881, next to nothing is to be found about cholera. It, along with yellow fever, came under consideration in the Section of State Medicine, where governmental measures for its exclusion from unaffected regions were alone discussed. To Dr. JOHN S. BILLINGS, of the United States Army, fell the duty of saying all that was to be said about the disease itself, and what he did say was so brief that it may be conveniently reproduced here.†

With regard to cholera, the opinions of the majority of American physicians agree, in the main, with the conclusions of the Cholera Conferences of Constantinople and Vienna. The Government Report on the cholera of 1873 maintains what PETTENKOFER terms the origin by contagion of cholera, as opposed to the theory of its local or endemic origin in America.§

It does not, however, maintain the personal contagion of the disease, and the difference between the two views seems to be of small importance so far as practical measures of prevention are concerned.

Much can be done to check and stamp out an outbreak of cholera by securing pure water supplies, and by the proper use of disinfectants, and it is probable that much more can be effected in the way of personal prophylaxis in this disease than in yellow fever.

* This year (1883) a death from cholera on the 31st May was certified at the General Hospital. Fatal cases also occurred in June and July.

† Infants.

‡ *Transactions of the International Medical Congress, Seventh Session, held in London, 2nd to 9th August 1881.* London: J. W. KOLOKMAN. Vol. iv, p. 416.

§ PETTENKOFER's views were popularised in England by the publication in 1875 of HIME's translation of the Munich professor's work on the prevention of cholera. One passage suffices to show in a general way the ground then taken:—

The occurrence of cholera, and its frequency, depend therefore essentially on the simultaneous co-operation of several, but chiefly of three, causes, viz., the traffic, the local and temporal disposition, and the individual disposition. If one of these factors be wanting, no matter which, there can be no outbreak of cholera. (The italics are mine.)—*Cholera: How to prevent and resist it.* By Dr. MAX V. PETTENKOFER. Translated by T. W. HIME. London: BAILLIÈRE, TINDALL, & COX, 1875. P. 26.

The experience of our army medical officers in checking the spread of cholera among the troops by careful supervision of their water supply, and the results of the use of disinfectants in New York and on Blackwell's Island, illustrate these statements.

With regard to quarantine, even under the exceptionally favourable circumstances of public opinion supporting it and the Government being strong enough to enforce its observance indiscriminately, Dr. BILLINGS says:—

The present quarantine systems of the United States are now probably unable to prevent the introduction of this disease as they have been heretofore. Unless the disease had actually occurred on board ship, very little precaution would be taken, and very few of our ports have the necessary facilities for properly dealing with a large passenger ship, having cholera on board, in such a manner as to obtain a reasonable amount of security without causing unreasonable delay, involving unnecessary suffering and danger on the part of those not actually sick.

No system of quarantine, however organised, can be expected to remain thoroughly efficacious for more than a very few years, for it will not be supported by public opinion. In the first year or two after a great epidemic, sanitary rules can be enforced; but, as HIRSCH says, "It is human nature to soon forget past sufferings. We bury our dead; a little time will dry our tears; in another little time we dance over their graves."

Referring to the means of disinfection commonly used on board ship and in private houses, when a contagious disease has been present, the following caution is valuable:—

To entirely destroy the vitality of the lower organisms when dry, by means of sulphurous acid gas, requires a very much longer exposure than is ordinarily supposed. Probably not less than 48 hours would be necessary to give entire security.

As was natural in the circumstances under which the subject of cholera was introduced, nothing was said about treatment, and the pathogeny of the disease was dismissed by Professor DE CHAUMONT in a few vague words about germs which,

Whatever they are, must be extremely minute, seeing that they have so successfully baffled our researches up to the present time; and if they themselves are minute, how much smaller must their spores or reproductive particles be.

To the *Eighteenth Annual Report of the Sanitary Commissioner with the Government of India* is appended a valuable memorandum by Surgeon-Major LEWIS on the cholera outbreak at Aden in 1881. The circumstances connected with the epidemic are briefly as follows:—

Previous to 1881 cholera had not appeared at Aden for 14 years. Shortly before the first cases were observed in 1867, the disease was known to have been prevalent in a district about 40 miles distant from the settlement, and the sudden outbreak at Aden was attributed to "choleraic blasts" from that direction. In 1881, however, cholera does not appear to have been observed in any of the outlying districts previous to its sudden manifestation in the settlement. The numerous deaths which occurred in June and July 1881 (370, as against 164 in 1880 and 118 in 1879) attracted the notice of the local authorities, and a special inquiry had been instituted before any case of cholera was recognised, the mortality having been for the most part attributed to dysentery and diarrhoea. After attention had been drawn to the death rate, "cholera, or a disease closely resembling it," was reported as having occurred among a gang of coolies engaged in unloading a pilgrim steamer which on the 1st August arrived at Aden after a 13 days' voyage direct from Bombay. This steamer had been visited by the port surgeon immediately on her arrival, and he reported "the cargo sweet and clean, the hold dry and clean, and the ship free from disease." No death from cholera had occurred during the voyage,

and after leaving Aden the further voyage to Jeddah, and the return voyage to Bombay *via* Aden, were accomplished without the appearance of cholera on board. The ship, its passengers, crew and cargo, may therefore be excluded from consideration as possible media of infection. On the other hand, the coolies attacked were inhabitants of villages crowded by famine-stricken refugees who had made an invasion during June and July. They were starving, they were densely packed, and their surroundings are thus officially described:—"The villages lie low, the people are poorly fed, without any good water, badly housed, with the midden system in operation, and the soil impregnated with faecal matter. The courtyard of almost every house contains one or more cesspools, which are dug and filled up according to the requirements of the residents." Add to all this that in the immediate neighbourhood of one of the villages there is a graveyard, where during the previous three years some 3,000 interments had taken place. It was not asserted that the first case of cholera reported had ever been near the steamer, nor was it denied that cholera was probably present before the steamer reached Aden. The local authorities, however, held that the disease was imported with the steamer's cargo, and a Deputy Surgeon-General, who drew up a memorandum on the subject, wrote:—"If there be any truth in the generally accepted views that the poison of cholera is contained in the evacuations of the cholera-stricken, the conveyance of the germs of the disease to Aden may be accounted for as plausibly and as probably as anything which cannot be positively demonstrated."

The story thus condensed from Surgeon-Major LEWIS's elaborate memorandum is not in itself of much interest to us, but it acquires importance as the foundation upon which are based the opinions expressed and the conclusions reached by an observer of great experience and long-tried skill in the investigation of disease. LEWIS's opinions and conclusions are the following* :—

The discovery of a cholera germ has frequently been "authoritatively" announced, and organisms of the most varied character have been described as being the essential cause of the disease, but none of the announcements have stood the test of inquiry.

The idea that cholera originates *de novo* in India, and in India only, and is thence disseminated by means of human intercourse, and still further diffused by rivers or by the wind, has taken so firm a hold on the minds of the medical profession and the public at large, that any other conceivable method of the origination of the disease is almost completely ignored, notwithstanding that a long array of facts have been recorded, which prove that epidemic outbursts of the disease occur under conditions when none of these factors can be shown to exist.

What the essential cause may be is wholly unknown, but surely it is wiser frankly to avow our ignorance than to promulgate purely theoretical doctrines which tend to divert the attention of governments and individuals from the necessity of getting rid of known local causes of ill-health, and which, if carried to their logical conclusion, would seriously interfere with personal liberty, and prove very embarrassing to the commercial intercourse of nations.

Since the occupation of Aden in 1839, we have accounts of five epidemics of cholera as having occurred there—in 1846, 1858, 1865, 1867, and lastly in 1881. The Suez Canal was opened in 1869, and yet, notwithstanding the enormously increased communication between India and Aden since that period, the interval between the last epidemic and that of 1867 is considerably greater than the intervals between the two preceding epidemics.

The convict settlement in the Andaman Islands likewise furnishes a striking illustration of the non-transportability of cholera by means of ships. Notwithstanding that it is within three days of India and of two from Burma, and that constant communication has been kept up between it and the two countries during the last five-and-twenty years, not a single epidemic of cholera has occurred amongst

* *Op. cit.*, pp. 177, 178, 179. I have slightly altered the order in which they appear.

a population of (at present) over 10,000 convicts, although cases have on some occasions been imported there, and have died from the disease after landing. Nearly all the food for the convicts is imported from Calcutta—a place from which cholera is never wholly absent.

Practical experiments of this kind and on so large a scale cannot be lightly set aside in favour of purely theoretical views, however ingeniously and earnestly those views may be advanced, and however eminent those who promulgate them may be.

The "local-origin" theory is therefore that which now finds favour with the official sanitary staff in India, but the grand total of their observations leads them to no conclusion as to the *materies intima morbi*.

There is a vast distance between LEWIS's contemptuous rejection of all theories that are not based on a rigorous investigation of well-ascertained facts, and the wild speculations which attracted much attention in England eleven years ago, when a Mr. B. G. JENKINS, of the Middle Temple, attempted to connect cholera epidemics with auroral displays and solar disturbances.* As a matter of curiosity, and by no means with the desire to revive a theory, which after all was only resuscitated and not created by Mr. JENKINS, and which is now happily dead again and re-buried, I reprint here the remarkable conclusions with which the paper as partly published in *Nature* closed.

My own opinion, derived from an investigation of the subject, is that each planet, in coming to and in going from perihelion—more especially about the time of the equinoxes—produces a violent action upon the sun, and has a violent sympathetic action produced within itself—internally manifested by earthquakes, and externally by auroral displays and volcanic eruptions, such as that of Vesuvius at the present moment; in fact, just such an action as develops the tail of a comet when it is coming to and going from perihelion; and when two or more planets happen to be coming to or going from perihelion at the same time, and are in, or nearly in, the same line with the sun—being of course nearly in the same plane—the combined violent action produces a maximum of sun spots, and in connexion with it a maximum of cholera on the earth. The number of deaths from cholera in any year—for example, the deaths in Calcutta during the six years 1865–70—increased as the earth passed from perihelion, especially after 21st March, came to a minimum when it was in aphelion, and increased again when it passed to perihelion, and notably after equinoctial day; thus affording a fair test of my theory.

The application (with modifications) of the germ theory to the explanation of the etiology of cholera has recently found a powerful and eloquent advocate in Professor MAX VON PETTENKOFER of Munich, to whose opinions I referred briefly on page 25. As the latest exposition of the most advanced views on the subject, this contribution deserves reproduction in full.†

It was only after long hesitation that I promised to discuss the cholera question in this place, where we are concerned with the parasitic doctrine. In 1854 I opened my career in the Medical Society with papers on the etiology of cholera, and now, after 26 years, I am about to close it with the same subject, committing and recommending further investigation to younger hands. What finally determined me to accept your invitation was the circumstance that the Cholera Commission for the German Empire,

* *Nature*, 9th May 1872, p. 26. The writer, by the way, predicts that 1883 will be "a year in which cholera is at a maximum."

† PETTENKOFER's paper, which by German admirers and believers is qualified as "Epochmachend," was read before the Munich Medical Society on the 28th April 1880, and is published in a volume entitled *Zur Ätiologie der Infektionskrankheiten mit besonderer Berücksichtigung der Pflanztheorie*. München, 1881. S. 333. Whether it is destined to immortality or not remains to be proved. I see by a notice in the *Lancet* that it has been translated into English and published in the appendix to a late issue of the *British Army Medical Reports*, but I have been unable to obtain this translation, or to obtain it in time.

of which I was a member, has recently completed its labours, and in accordance with its own wish has been dissolved. It was at the suggestion of Medical-Privy-Councillor Professor HIRSCH of Berlin whose pre-eminence as an epidemiologist we all acknowledge, that the Commission was formed. He invited me at a propitious moment to address, in conjunction with him, a representation to the Imperial Chancellerie. This Board appointed as Commissioners—the two promoters; Dr. BÖGER, private physician to the Emperor; Dr. GÜNTHER of Dresden, Ministerial Referee for the Kingdom of Saxony; and Dr. VOLZ of Karlsruhe, Chief Medical Councillor for the Grand Duchy of Baden. The post of president was conferred on me. In 1876 the Commission sustained a grievous loss in the death of Dr. BÖGER, who, however, was efficiently replaced by Dr. MEHLHAUSEN, Director of the Berlin Charité Hospital.

In the summer of 1873, just before the outbreak of the last cholera epidemics which Germany has had to endure, the Commission assembled for the first time in the Imperial Chancellerie in Berlin.

The reports of the Commission have been published in six volumes by HEYMANN of Berlin, and the Government has most liberally provided for their elucidation by means of tables, plates, and maps. This is not the place to describe the contents of each volume, and, besides, I may assume that most of those present are familiar with them. Here I have merely to show how far the results of the Commission's investigations are in accordance with the germ theory, which is the main subject of this year's communications to the Medical Society. It is true that there is no report devoted solely to mycology. All deal merely with the facts arising out of the spread of the epidemics in space and time. But although nobody either sought or found a specific cholera organism, the facts testify so clearly to its existence that the operation of lowly forms of life in some manner still unknown to us may be assumed. Under every aspect, the behaviour of cholera relegates it to the group of zymotic diseases [*Infectionskrankheiten*], and its essence must lie in an infective germ, to seek which is the task that remains to be undertaken. In order to find it, the most important preliminary is to know where to look for it. Formerly the exciting causes of zymotic diseases were classed as contagia and miasmata, latterly as entogena, which multiply chiefly within the organism, and ectogena, which multiply outside it. The old controversy as to whether cholera should be placed among the entogenous (contagious) or ectogenous (miasmatic) zymotic diseases appears to me to be nearly settled by the investigations of the German Cholera Commission, and even if that Commission were to have produced no other fruit, it would have been well worth while to appoint it. Whoever attentively and thoroughly peruses the reports will be convinced that cholera, alike in its Indian home and among us, depends on conditions in space and time external to the [human] organism. HIRSCH has correctly expressed the existing relation when he says (vol. vi, p. 309):—

If, as is commonly the case, the term "contagion" is held to indicate that mode of communicating zymotic diseases in which, within a specifically diseased individual, a poison is developed or an organic disease germ is reproduced which, thrown off from the sick person and directly transferred to another individual susceptible to the virus, reproduces that same specific disease-process (a mode of communication well known and acknowledged in the cases of small-pox, scarlatina, typhus fever, etc.),—then an unbiassed examination of the experience gained during the 1873 epidemic as to the mode in which the malady spreads will afford no ground for the inclusion of cholera among contagious zymotic diseases.

And so he proceeds at page 312:—

The theory of the communicability of cholera by contagion in its strict sense being therefore destitute of any real foundation, while, on the other hand, communication does undoubtedly occur, the only possible supposition that remains is that either (1) the raw material of infection [*Infectionsstoff*] is given off from cholera patients, but is not in itself operative as cholera-poison, acquiring specific infective properties only after it has undergone, outside the organism, a certain change,—a sort of maturation under the influence of the external conditions before enumerated, on or in the soil, or in something that takes the place of the soil; somewhat, for example, as the ovum formed in the ovary becomes fruitful only after the ingress of spermatozoa; or (2) the multiplication (reproduction) of the specific poison occurs quite independently of the cholera patient as such, the virus clinging to individuals whether sick or well or to other objects, and being borne about from place to place by these, giving rise to an epidemic wherever it encounters the conditions essential to its reproduction. Both hypotheses have *primâ facie* equal claims to consideration.

HIRSON gives preference provisionally to the former, I to the latter of these theories. Further observations and investigations must decide upon which side the truth lies. It is sufficient for me that justice has at length been done to the "localising" theories.

In addition to my own labours and those of my pupils and friends, many of the investigations detailed in the reports of the Commission have largely contributed to the recognition of the essential influence of locality on cholera. I place in the foremost line HIRSON's general view of the spread of the 1873 epidemics through all Germany. Whoever examines the maps constructed for the purpose by HIRSON, and observes the relatively narrow and sharply defined limits within which the cholera of that year progressed epidemically, must disbelieve that the spread of epidemics presupposes nothing more than intercourse with cholera patients or infected regions and the presence of predisposed individuals. On the contrary, he will be forced to assume that the locality into which the germ was brought played an essential part in the event.

GÜNTHER's elaborate monographs on the 1873 epidemic in the Kingdom of Saxony, published in the third volume of the Commission's reports, testify no less clearly in this sense. He fixed his attention on the local and temporal spread of cholera not only in 1873 but in all the years in which cholera showed itself in Saxony, namely, in 1836, 1848-50, 1854-55, 1865-67, 1872-73. The results for each month of 1873 are represented graphically at page 10 of the text, and the results for each locality are shown on the maps of Saxony in the atlas. We may trace on these maps the gradual development of the railway system in Saxony, and answer the question whether cholera epidemics exhibit a tendency to establish themselves along lines of rail or to increase in number and frequency with the extension of railroads. Facts reply unequivocally in the negative, which could not be the case did cholera really depend on contagion [*wenn die Cholera auf wesentlich contagionistischem Boden ruhte*]. It is worth while to reproduce the terms in which GÜNTHER sums up the results of his investigations. He says (p. 98) :—

Of the eight cholera epidemics which have visited Saxony since 1836, that of 1873 ranks fourth in severity, having regard to the total number of victims.

The epidemic spread of cholera in Saxony bears no relation to the extension of the railway system.

In 1873 it chiefly attacked certain villages in the immediate neighbourhood of Dresden and certain streets in the city itself, so that 89 per cent. of all the deaths occurred within the Dresden jurisdiction, while of all the deaths from cholera in Saxony between 1836 and 1873, only 10 per cent. occurred within that jurisdiction.

The first patient in Niedergorbitsch and the first in Groitzsch had been in communication with Magdeburg, where cholera already was; the first in Löbtau had had traffic with Niedergorbitsch, and the first in Grossröhrsdorf had had relations with Löbtau. In spite of the very active intercourse that was maintained between the inhabitants of the stricken villages and the city, it was not until after the lapse of six weeks that cholera began to spread epidemically, but in a limited manner, in Dresden.

The affected quarters in Löbtau, Dresden, Groitzsch and Grossröhrsdorf lie low, and in the neighbourhood of a watercourse. The soil of each is pervious. The soil under the house which in Dresden was most virulently attacked had been rendered extremely filthy by the drainage from a great number of households.

The epidemic reached its height sooner than usual. Thus :—

MONTHS.	Per-centage of all Deaths from Cholera in Epidemics between 1836 and 1873.	Per-centage of Deaths from Cholera in 1873 Epidemic.
July	3.8	36.0
August	20.0	41.3
September	42.5	11.5

The acme of the epidemic in Dresden corresponded to the maximum temperature of the air, and of the soil at the depth of 1 mètre.

The period of life between 10 and 20 years showed the smallest relative number of cases and deaths, and the smallest mortality among those attacked.

One death and no more occurred in 62.2 per cent. of the houses attacked.

In 79.1 per cent. of the houses in which more than one death occurred, the interval between the first and last death was less than 14 days.

In 66.1 per cent. of the fatal cases, death occurred within 24 hours.

MEHLHAUSEN has investigated the cholera epidemic of 1873 in the army of the territories included in the late North-German Confederation. In his instructive paper he is impartial with regard to the "contagion" and "local" theories, and admits the claims of both. In the end he fell in with the views of HIRSCH, as formulated by the latter in the sixth volume, where he gives his own opinion, which was that of the majority of the Commission.

In the fifth volume will be found VOLZ's report on the epidemic in Würtemberg, Baden, and Hesse, in which the epidemic in Heilbronn is mainly considered. VOLZ does not indeed overlook the influence of locality, but he believes that no greater importance should be accorded to it than is here and there indicated in the case of other epidemic diseases that are directly contagious; and it seems to him that no real difference exists between a focus of cholera and a focus of small-pox, between a house stricken by cholera and one stricken by small-pox. His remarkable conscientiousness, nevertheless, led him, when condensing the main results of his observations, to leave apparently more for localisers than for contagionists to pick up. Thus:—

The cholera epidemic in Heilbronn presents the following notable circumstances:—Sudden outbreak among seven persons in six houses within a limited space; undemonstrated importation; simultaneous occurrence of cholera in North Germany, Vienna, Munich, and Würzburg; prevalence of gastric disorders, diarrhoea and cholera at the same time in Heilbronn, especially among children; occurrence of a case of cholera in Heilbronn 22 days previously, in a remote situation, and residence of the convalescent 15 days previously in a house close by one of the epidemic-originating houses; swift extension through widening circles in consequence of free intercourse, in the absence of any precautions limiting the latter; gradual epidemic spread, down stream, in a northerly direction, the local conditions being the same; exemption of the districts lying southwards, up stream, although other conditions were similar; removal of the earliest cases into distant streets and quarters of the city, without further extension of the disease or creation of secondary foci; occurrence of one or more cases, or even of a household epidemic, immediately subsequent to such removals, or after an interval; or, on the other hand, absence of any fresh cases. Removals were effected into seven outlying districts, in all cases followed by the death of the patient; but in only one district did an epidemic arise; one removal was in the person of a healthy individual coming from an invaded house; in the city hospital, which lay outside the stricken district, but which received 84 cases of cholera, strict isolation prevented the occurrence of an epidemic within the walls, and in fact prevented the occurrence of a single case in the other sections; in the almshouse for aged people, which stood close by, a house-epidemic spread from one case. A few cases are important for fixing the incubation period; the maximum in three was one day, and in a fourth was three days. The invaded quarter, the cholera district in fact, is the oldest part of the city, the most low-lying along the Neckar, and unsatisfactory as regards its cleanliness; it is intersected and surrounded by an ancient network of subterranean canals. The soil is composed of a stratum of gravel resting on loam, and covered to a variable depth (from 3 to 20 metres) by clay. This layer is at its least depth near the Neckar, in the cholera district. In the upper city the buildings are more open, the canals are less numerous, and the clay stratum is thicker. The water supply, which is derived from the quartz, is pure. The summer of 1873 was dry, the Neckar low, the ground water dependent on it far from the surface; the last occasion on which it reached high-water mark having been 15 months previous. At the beginning of the epidemic—that is to say, during 14 days,—no energetic precautions were adopted; there was free intercourse, but also a certain amount of disinfection. During two days at the beginning of the third week the inhabitants of the invaded dwellings were removed, and sulphur fumigations employed; no other cases occurred in these houses; no emigration was permitted to the quarter into which this removal was made, and which was at a distance from the cholera district. The epidemic attacked 192 individuals, and destroyed 96. The maximum intensity was reached in the first week, a uniform rate of attack was maintained during the two following weeks, and then diminution set in. The epidemic lasted 62 days, from 26th August to 26th October. Women were, as regards absolute number, attacked in a larger ratio than men—122:70; yet among them the disease was proportionally less fatal—55:41; but the numerical ratio of the sexes is unknown.

No class was specially attacked; no physician suffered. Of the nursing staff, five fell ill, with two deaths; none of those employed about the burials were attacked; the poorer folk sustained the heaviest losses.

I must mention one more paper which HIRSCH has admitted to the sixth volume, and which cannot fail to make a lasting impression. It is a survey of the spread of cholera in the department of Oppeln during the years 1831-74, derived from official sources by Dr. PISTOR of Oppeln. This department is one of the regions most affected by cholera.

In 1831	1,658 cases occurred, with	993 deaths.
1832	3,270 " "	1,578 "
1836	4,324 " "	1,754 "
1837	1,159 " "	633 "
1848	308 " "	182 "
1849	5,595 " "	2,596 "
1851	898 " "	476 "
1852-53	3,856 " "	2,073 "
1855-56	5,498 " "	2,778 "
1866	9,069 " "	3,888 "
1867	4,438 " "	1,947 "
1872-73	2,332 " "	1,157 "
1874	2,499 " "	1,274 "
TOTAL	44,904 cases.	21,329 deaths.

The average population of Oppeln during this period may be estimated at 1,000,000.

Casting aside all hypotheses, and drawing his materials from official documents preserved in the central and local registries, PISTOR has undertaken to set forth, by means of maps, tables, and graphic curves, the topographical and chronological spread of the disease in this fruitful cholera soil from its invasion in 1831 to the close of the 1873-74 epidemic. He has done this with the conviction that in a general way reliable information is thus already given as to the susceptibility of certain places and districts and the immunity enjoyed by others, which information will be perfected if during future epidemics in Upper Silesia the observations undertaken by him are pushed on and completed.

His comprehensive investigations have led him to the following five conclusions:—

1. Epidemic cholera never originates as such in Upper Silesia; the germ is always imported.
2. Spread of the epidemic has a distinct connexion with human intercourse, but is not so closely connected with lines of communication that, for instance, districts lying along a railroad are specially visited.
3. The affected individual and what he carries with him may successfully transplant the hypothetical cholera germ, supposing that conditions are encountered favourable to its further development.
4. The following conditions seem to favour the development of the germ and the epidemic spread of cholera:—
 - a. Density of population, especially the thronging together of many individuals in relatively small dwellings, and the unhealthy state of things arising therefrom.
 - b. Saturation of the soil with matters prone to decomposition, or a state of soil favourable to this decomposition.
 - c. Atmospheric conditions, in so far as rapid alternations of heat and cold, drought and moisture, aid the process of decomposition just mentioned, and as sudden changes in the temperature from day to day or from day to night increase individual predisposition.
 - d. Poverty and indigence, with their inevitable general and personal consequences—bad habits, bad dwellings, etc.
 - e. Unwholesomeness of drinking water may [kann] favour epidemic spread.
5. Contact with cholera patients does not in itself occasion infection. Infection follows only when the recipient is exposed to the same conditions as the patient. The poison does not seem to develop in the human body, in the sense of rising to a higher power. Cholera is therefore not to be enumerated among the truly contagious diseases.

It is not my intention to discuss these conclusions here. I will merely make a few remarks on paragraph 4 *e*, which refers to drinking water. The drinking water theory is still held by many to be sufficient to render the local theory unnecessary, its adherents maintaining that the local and temporal predisposition is to be sought in the drinking water; that cholera epidemics appear in the places and at the times when that water is rendered impure by cholera dejections; and that thus the problem why only certain places, and not all places, are attacked, and that not at all times, is clearly explained. Many will probably consider that PISTOR is an adherent of the drinking water theory, since he says that unwholesomeness of drinking water *may* favour epidemic spread. But no one who reads page 224 of his report can think that he attributes any *rôle* to bad water differing from that of bad nourishment, impure air, insufficient clothing, etc., namely, an influence on individual predisposition. Just as clearly as investigation of the 1873-74 epidemics demonstrates the influence of locality, just so certainly is the influence of drinking water forced into the background. The contrary must have been the case if the truth lay in the drinking water theory, especially in the form still widely accepted in England, for it must be confessed that there was no lack of sympathy with the theory in Germany. At the Cholera Conference of 1867 at Weimar, authoritative voices (GRIENINGER, HIRSCH, DELBRÜCK, etc., along with JOHN SIMON) were unequivocally raised in its favour. The Cholera Commission of 1873, in its programme of investigation, emphatically challenged a careful inquiry into the influence of drinking water, but the case looks desperate when HIRSCH, in the last volume of the Commission's reports, after so long a time, and so many efforts to discover evidence, can only say:—

Although no decisive proof of the theory of the direct or indirect influence of foul drinking water on the spread of cholera is to be derived from these observations, there is no justification for considering the question as resolved in the negative, on the strength of the negative results yielded by investigation of the drinking water in many cholera regions. It has never occurred to any inquirer, not even to the most zealous adherents of the theory, to assert that the spread of cholera is due to drinking water only. Rather is it acknowledged on all sides that water is only one of the media, or may become one of the media, which act as carriers of the poison into the human organism.

It is at least certain that the epidemics of 1873-74 have yielded no proof of the theory. Its adherents have therefore again to wait on the future for their vindication. I do not think that I prophesy falsely when I say that in the end it will happen to them as it has happened to me. The more zealously I identified myself with the demonstration of the influence of drinking water on cholera and typhoid, in which I myself at first believed, the more untenable I found the hypothesis. I and those who think with me have conscientiously complied with the demands of those who still believe in drinking water as an infection carrier. When we proved that the cholera and typhoid epidemics in Munich betrayed no connexion with drinking water, appeal was made to other places,—for instance, to Roveredo. When we proved in that case exactly what we had proved for Munich, we were referred to the fortress of Marienberg. When this had also to be surrendered, we were sent to Posen; and when that stronghold gave way, then to other places. So one might hunt down a place through the whole world, but there would always be yet another one of which it would be asserted that there drinking water was the cause of cholera or typhoid epidemics. I am now fully determined not again to stir from my position until the adherents of the drinking water theory have supplied their lacking proofs. My disbelief does not, however, prevent me from taking every opportunity of warmly supporting, on general hygienic grounds, the provision of a pure and plentiful water supply for every inhabited place. I am thus in agreement with J. M. CUNNINGHAM, D. D. CUNNINGHAM and TIMOTHY LEWIS, in India, who, after unprejudiced and minute investigation in the very home of cholera, have not adopted the drinking water theory.

As it may now be regarded as established that the cholera germ is distributed from cholera-stricken places by means of human intercourse, but that it always requires a certain local condition in order to develop epidemically, the question which next arises, and the solution of which is essential to the advance of our knowledge, is this—wherein does this local condition consist, and how does it arise? The parasitic doctrine alone renders it possible to answer this question, which is so important alike from the scientific

and from the practical side. The infective material which causes cholera may be an organised substance—a fungus; or the product of a fungus,—for instance, an unorganised ferment or an organic poison, like the poison elaborated in meat by the bacteria of putridity. In any case, we have to do with a process depending on the life of low organisms, and with the local conditions surrounding the process itself. Investigations into the action of parasites have as yet hardly taken account of these latter. Inasmuch as facts compel us to admit the existence of local and temporal auxiliary or predisposing causes, the only mode of inquiry, whether experimental or statistical and pathological, which can attain its object is one that takes careful account of local circumstances and peculiarities. This remains true whether HIRSCH's view be adopted, which corresponds closely with the "diblastic" theory of NÄGELI, or my view, which is styled by NÄGELI the "monoblastic" theory. I have no objection to call any given soil on which epidemics thrive unhealthy. On the contrary, the expression suits me very well. But we should first ascertain the conditions which render a soil unhealthy or healthy. Even if schizomycetes play the most important part in determining these conditions, their mere presence is not decisive, for they are to be found in every soil and every house, and are not confined to cholera-infected soils and cholera-infected houses. There must therefore be either special or specially modified schizomycetes. If the explanation lies in a certain accommodation of the organisms to their environment,—that is to say, to different nutritive fluids,—all such conditions must be sought in the soil or in the house, and brought to light. We must discern what it is that underlies the cholera germ, what its nutriment is, what its host; and this indeed may all the sooner be discovered the longer we refuse to acknowledge the existence of a specific cholera germ. It was thus that sugar was found to be the necessary antecedent of alcoholic fermentation in grape juice and malt wort before the action of the yeast organism was known.

I have always regarded the cholera process from the parasitic point of view. In 1869 I published a paper, in a special paragraph appended to which, under the heading "Hypothetical,"* I wrote as follows:—

With reference to the specific cause of cholera, the idea obtrudes itself more and more forcibly on us that it is something organised, of such tenuity and minuteness that it has hitherto eluded direct observation, like those air-borne fermentation germs which, when they encounter conditions suited to their further development, we recognise in operation and at a more advanced stage as yeast cells.

How completely I even then accepted as typical the alcoholic fermentation, which up to the present is the best understood parasitic process, comes out still more clearly in the following extract:—

Let us suppose the germs of alcoholic fermentation less generally distributed, to be perhaps at home only in India, and thence diffusible only by intercourse, like the germs of cholera. Let us further suppose that in certain places and at certain times within the memory of man grapes have ripened and juice has been expressed from them which, however, never fermented, and therefore was used without any particular effect and without hurt, so long as that Indian specific fermentation germ was unknown. If now traffic should happen to introduce the fermentation germ into the grape districts exactly at the grape season, epidemics of drunkenness would break out among the inhabitants if they could not avoid drinking the fermented juice, just as cholera epidemics break out while we breathe the air of certain localities.

When I again read over my 1869 paper, I found that up to now, when we have advanced the parasitic theory as our etiological creed, hardly any change has come over my opinions, and that when I wrote it I knew nearly as much as at the present day is regarded as true. Were I to express my opinion about the etiology of infectious diseases, with special reference to the parasitic theory, I might again use the words I uttered then. I said, for instance:—

The simile of vinous fermentation moreover suggests something to which hitherto too little attention has been paid. Most people are prone to consider the disease simply as resulting from the reception of the Indian cholera germ into the body; while it probably is, like alcoholic intoxication, the result of the absorption of a product which is perhaps

* Boden und Grundwasser in ihren Beziehungen zu Cholera und Typhus.—*Zeitschrift für Biologie*, Bd. 4, S. 274.

not organised, and which arises out of the reciprocal action between the germ and the local and temporal conditions, just as alcohol springs from the action of fermentation germs on the locally produced must.

I know very well that the case may be otherwise, but mycological and pathological investigation would be at fault if it left unconsidered the analogy which I have indicated. The incubation period in cholera seems to be on an average as short as that of septic intoxication, and therefore does not in the least contradict my assumption.

My former paper contained many other thoughts to which the parasitic doctrine of the present day lends much weight. Thus :—

Further, it cannot be disputed that it is both possible and probable that the process which immediately produces the *materies morbi* in cholera is, like vinous fermentation, liable to various interruptions arising out of all sorts of collateral circumstances. In spite of the proper amount of sugar in the must and of the presence of the ferment, the fermentative process often yields little or no alcohol. Like the alcohol-producing germ, the cholera germ is not always victorious over other germs in the struggle for existence. The sugar in a fluid, moreover, often, instead of alcohol and carbonic acid, produces lactic and butyric acids, which are not in the least intoxicating. The mere degree of concentration or dilution of the normal ingredients of the must or wort has also a powerful influence on the briskness of the fermentation and on the ultimate products. A concentrated saccharine solution prevents not only alcoholic fermentation, even when yeast is added, but also other changes, such as the putrefaction of organic matter.

Let this suffice to show that I have never been an opponent of the parasitic theory. I have never done more than protest against that doctrine of simple contagion which I am persuaded is false, while I have endeavoured to obtain a place for local circumstances in the conceptions of epidemiologists. I have thus sought to direct into productive channels the experimental investigation into the action of parasites in which I cannot myself share. Studying the results of the Cholera Commission's labours in the light of the now dominant parasitic theory, I might, supposing cholera not to be a septic intoxication as I above represented it, hold as most probable that intercourse with places wherein the disease is endemic or epidemic diffuses, in a manner still unknown to us, the unknown organism which produces cholera. This organism, however, when transported to another place without any loss of its poisonous properties, multiplies only when in that place it encounters an unknown condition depending on the soil and providing it with nutriment and shelter. Such condition may indeed be found in man himself, or (as seems more likely) in the soil, and by means of the soil, in surrounding dwellings and their contents. Even in those cases where epidemic outbreaks of cholera appear to occur without intervention of the soil—for instance, on shipboard,—the simultaneous presence of the unknown germ, and the unknown condition arising somehow from shore influences, must be assumed.

Let me finally say a few words about what seems to me to be in any case the main point in practical prophylaxis. We may attempt to overcome the germ and its favouring conditions by means of precautions. This side of the matter was of course thoroughly considered by the Cholera Commission, whose recommendations closed thus :—

Among all the measures which may be adopted for the purpose of repelling and combating cholera, those are of the first importance which aim at an amelioration of general sanitary conditions. All specific measures directed exclusively against cholera will prove useless until in inhabited places satisfaction is given to those demands which rather aim at the cleansing of the soil from rapidly putrefying organic matters, at drainage, continual flushing of sewers, frequent emptying of privies, impartial abolition of cesspools, supervision of dwellings, and closure of those that are certainly dangerous, provision of pure water for drinking and domestic purposes, and the like. On this subject the Commission expresses the conviction held by every experienced physician, namely, that strict observance of all the precautions publicly recommended as promotive of health affords the surest protection not only against cholera but against epidemic disease in general; that, however, all these precautions assert their sanitary influence only when they are continually observed; and that those persons deceive themselves who expect by observance of them only when an epidemic is nigh to enjoy protection against disease-producing influences.

I admit that the position thus adopted by the Commission is far from having in all respects a rigorously scientific basis, but I must also acknowledge that, in the present condition of our positive

knowledge and experience, it is practically the soundest. Chariots were built and won races before the laws of motion and friction were known. Communication was had with remote places before the days of the electric telegraph. And so we recommend cleanliness, drainage, and plentiful provision of pure water, elevated sites, ventilation, etc., for although we do not know their intimate relations to the cholera process, we obtained many proofs during the 1873-74 epidemics of their favourable influence on health, and of the unfavourable influence of their opposites. As science further develops, we may expect just such advances in our knowledge about these matters as resulted to trade from railroads, steamboats and telegraphs as soon as an intimate knowledge of the laws of motion and electricity rendered their application to practical problems possible. Empiricism exhausts itself and repeats itself. To science belongs continual progress and the future.

Thus far PETTENKOFER. It will be observed that he slurs over the important consideration of individual predisposition, which must play an essential part in determining what persons out of many exposed to identical external conditions will fall victims to the disease. He likewise fails to dwell on the many weighty facts which point to the transformations of low organisms as destined to dominate in the near future the entire field of bacterial pathology.*

* As these sheets are passing through the press, my attention has been drawn to an article by Dr. VON PETTENKOFER in the *Neueste Nachrichten und Münchener Anzeiger*, 14th-17th July 1883, wherein the views above enunciated are further enforced and illustrated. The writer is specially emphatic in denouncing quarantine as extravagant and useless, adducing the remarkable instance of Malta in 1865, where, in spite of the most stringent precautions under the most favourable circumstances, an outbreak of cholera was not prevented. This outbreak and others under more or less similar conditions he attributes to the fructification of germs long before imported, and lying latent perhaps for months. The moral of which is that quarantine regulations are always and inevitably enforced too late. In this article attention is drawn to the facts of individual predisposition and immunity, which are striking phenomena in every epidemic, and which can be only partially explained, if at all, by visible external conditions. Finally, the vast importance of general hygienic measures, and the absolutely essential need of prompt attention to the first warning given by diarrhoea, are most urgently inculcated.

NOTES ON THE PREVALENCE OF EPIDEMICS IN 1882,
AND ON CERTAIN NATIVE DRUGS.

By D. J. MACGOWAN, M.D.

REFERENCE was made in my last Report* to floods which in July and August 1882 submerged to a slight extent the valleys of the department of Wênchow, but which were excessive in volume and destructiveness through the greater portion of Chêkiang, and yet more so in Kiangsi and Anhwei.

Floods of certain rivers (as the Rhine, the Rhone, and the Virginian rivers) are followed by enteric fever, while those of others do not invariably bring disease in their train. On examining the list of fluviatile and marine inundations recorded in the *Shanghai Gazetteer*, extending through a period of a thousand years, and comparing it with the record of epidemics for the same period, it does not appear that the phenomena are correlated.

There was a flood in the seventh month A.D. 1451, when the entire region (including Soochow) suffered, and in the same year there was an epidemic, which carried off "innumerable people," but the month of the epidemic is not given, and even had the malady followed the inundation, it might have been attributable to famine, as famines often follow destructive floods, and disease always follows famine. This was clearly the case in the summer of A.D. 1493, when half the population of Shanghai died, the crops having been damaged by rain.

One of the tidal inundations, that of the third month A.D. 1576, was preceded or followed, which is not stated, by an epidemic.

Further medico-topographical researches require to be prosecuted before sufficient data can be obtained for generalising on fluviatile agency as a source of disease: the sort of sediment brought down and the nature of the soil on which it is deposited are important factors, which are not readily ascertainable.

When ascending the Yangtze last winter I instituted inquiries touching its inundations. There was no evidence discoverable that in any portions of the course of that river its periodical or extraordinary flooding gave rise to zymotic disease. I examined the register of the Mission Hospital at Hankow, under charge of Dr. MAWBEY, without finding any indications that disease was particularly rife after the subsidence of floods, and foreign residents concurred in affirming that floods have never proved sources of ill health. On the contrary, it is believed that they bear away accumulated filth, destroying (if they exist) malarial germs; showing, with Shanghai record, the harmlessness of inundation. This agrees in the main with what has been observed after Mississippi floods by Dr. CHAILLÉ,† who shows that such "overflows do not cause inevitably or generally any notable increase of malaria or of other disease, and that they certainly do not usually either cause or promote epidemics." Still, although I found that

* *Customs Medical Reports*, xxiv, 18.

† *New Orleans Medical and Surgical Journal*, June 1883.

Yangtze floods are not chargeable with engendering disease, it is believed by the natives that ague is rather more common when the waters recede than before inundation.

In one respect the floods certainly prove hurtful; field labourers suffer from ulcerated legs. In the upper portion of its course the Yangtze brings down sand, which it deposits on a porous soil; in its lower portion it deposits a tenacious, impervious alluvium and organic matter. In those regions intermittents are sequelæ of floods, but not to a remarkable extent, except when (as last year) embankments have given way, leaving still, stagnating water behind. At Wênchow the floods were comparatively innocuous; the autumn, however, was rather less healthy than usual, chiefly owing to a slight impulse of the choleraic wave, which was so destructive in Annam and the Philippines, but here causing merely an increase of endemic cholera. Accounts of that epidemic as given by the Chinese press represent it as extremely violent.

Near Manila, for example, out of 1,099 who were attacked in one day, only 105 survived,—the cases proving fatal generally in two hours. In Annam, foreigners seem to have been exempt, which was also observed when the epidemic appeared at Canton.

During the preceding year (1881) the Annamite portion of Indo-China was comparatively exempt from cholera, but the western portion (Siam) suffered. In June it appeared at Aden, and finally it raged through a great portion of the Malayan Archipelago, synchronous with an outbreak in Mexico. It prevailed next in Japan in April and May 1882, but in Annam and Manila, not until the summer had set in.

The epidemic was not severe at Canton until the latter part of November; in December it prevailed with considerable violence. In the same neighbourhood business was suspended, the inhabitants removing to safer places when they could. Often boatmen refused to take passengers, apprehensive of fatal cases occurring on board. One boat, on a journey of 200 *li*, lost 11 passengers out of 20. The dead were rolled in mats for want of coffins. It was a profitable time for Buddhist and Taoist priests, but their prayers were of no use. Making allowance for exaggerations, there is still evidence that the causes which led to the outbreak in Annam were operative in Kwangtung also. The reason assigned at Canton for the unusual prevalence of the endemic was the heat and dryness of summer and autumn, causing people to sleep out of doors, and checking perspiration. In December also a choleraic disorder was reported as prevailing in Foochow. The weather was changeable, a time of unnatural heat followed by sudden cold causing headaches. Later, people were attacked with purging and vomiting, followed by death in a couple of hours. The epidemic was confined chiefly to the ill-fed poor. Along the coast endemic cholera prevailed in the summer and autumn rather more than usual.

The foregoing remarks on retained flood waters as a source of disease are illustrated by an epidemic that prevailed at Nanking in October and November. The country was flooded by the overflow of the Yangtze, and left undrained. Intermittent fever prevailed in the city, and unacclimatised troops in suburban regions, who were occupied in repairing roads and canals, suffered from a virulent and fatal disease, perhaps typhus fever. In Dr. CHALLÉ's article on Mississippi floods it is stated that wherever the currents produced by the escaping waters swept the surface, no sickness was likely to ensue; wherever very deep deposits were

formed, the circumstances were not favourable to the evolution of malaria; but where slight deposits occurred from the *stagnant* water, violent malarial diseases prevailed. It was obviously to a deposit of shallow, still water that the insanatory condition of the region about Nanking is to be attributed.

An epidemic, none of whose features are given, broke out in Paohsing (Southern Hupeh) in the month of October, extending over into Kwangtung and Kwangsi. Intermittent and remittent fevers were more common than usual in the cities of Soochow and Ningpo in October, but without much mortality.

Hsiaokan and Huangpo, districts in Hupeh, suffered in the month of October from a contagious epidemic (probably typhus fever), which proved very fatal; coolies could not be hired to bury the dead. At a public meeting it was decreed by the inhabitants that wailing for the dead should be discontinued during the prevalence of the disease.

In November a cattle murrain, which also affected pigs, dogs and poultry, prevailed over a part of the Wuchang department. The flesh of cows that died of the pest presented a yellowish appearance, and persons who ate it suffered from swollen heads and hands, and ulcerated feet; their complexion turning yellow. In some cases death followed the use of the beef; in those, a swelling of the body was observed, which extended upwards, causing death on reaching the neck.

In December a form of diphtheria appeared in a district distant 100 *li* from Peking. In families of 10 persons, three or four were affected. In some cases it proved fatal.

The above epidemiological survey closes with December 1882.

FOWL'S GIZZARD. PEPSINE.

Among the drugs exported from Wenchow there is one which merits notice in this place from the attention that the article has lately received from Western pharmacologists,—fowl's gizzard. It became an article of the Chinese materia medica in the early half of the eighth century A.D., having been employed probably in domestic practice long antecedently. It would be interesting to learn whether Westerns derived their knowledge of the properties of the gizzard of the domestic fowl from China, or whether it had an independent origin. The properties of the drug known as *ingluvin*, which is prepared from the gizzard of the fowl, are wholly due to the internal membrane of that viscus. The Chinese ascribe healing qualities to the flesh, blood, heart, liver, brain, head, entrails, comb, fat, feathers, shells, eggs, excrement of fowls, and to the straw of their nests, but not to the gizzard itself. It is supplied to the shops by cooks of eating establishments, who in dissecting out the membrane are careful not to wet or waste the secretion, and thus portions of the bird's food are sometimes found adherent. When dried, the article, from its plicated form, resembles a scallop shell; its colour is a pale olive yellow, and it is very brittle. It is often found roasted or charred nearly black, and for the most part is employed in that form. It is generally boiled with other drugs; in a few cases it is administered unburnt, mixed with roasted rice, both being triturated together. The wholesale price varies from \$12 to \$30 per picul; it comes chiefly from Ch'uchou.

Fowl's gizzard is employed by the Chinese largely in bowel complaints of children, but particularly in urinary disorders, curing them of a malady that is indicated by "milky urine." It removes abdominal tumefactions, corrects incontinence of urine; it is valuable in spermatorrhœa, leucorrhœa, and in flooding following delivery; it corrects nausea, and is used to allay morning sickness in pregnancy; but of course its main use is in indigestion. In domestic practice the lining of three gizzards is thought sufficient for an ordinary case, the whole being taken in the course of 10 days. It is enjoined that hens are to be used for men, but in practice no sexual distinction is made.

A writer of the seventh century A.D. advocated its use in a form of ophthalmia of children, due to deranged liver, for which it is still employed.

Externally, it is employed in the treatment of indolent ulcers, carious teeth, ulceration of the throat (blown in through a bamboo tube), and in hæmorrhoids.

From the time of CHANG CHUNGCHU, a medical writer of the Eastern Han, cows' stomachs have been employed for most of the complaints named above. The viscus is to be minced and boiled in 10 bowls of water, with ginger and vinegar, down to one bowl. It is common for Chinese writers to indicate incompatibles. In taking pepsine in this form, the patient must abstain from the flesh and blood of dogs.

Pigs' stomachs came into use in the fourth century, chiefly for dyspepsia and analogous complaints, and are used also as an anthelmintic.

The stomach of sheep is first named as a tonic and stomachic in a work which, though attributed to SUNG SZEMO, a Taoist of the seventh century, is supposed to have been written in the Sung period.

II.—SPECIAL SERIES.

No. 1. —NATIVE OPIUM	Published	1864.
„ 2. —MEDICAL REPORTS : 30th Issue (<i>First Issue, 1871</i>)	„	1886.
„ 3. —SILK	„	1881.
„ 4. —OPIUM	„	1881.
„ 5. —NOTICES TO MARINERS : Fourth Issue (<i>First Issue, 1883</i>)...	„	1886.
„ 6. —CHINESE MUSIC	„	1884.
